

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-149135

(43)Date of publication of application : 05.06.2001

(51)Int.Cl.

A45D 26/00

(21)Application number : 11-333562

(71)Applicant : MATSUSHITA ELECTRIC WORKS LTD

(22)Date of filing : 25.11.1999

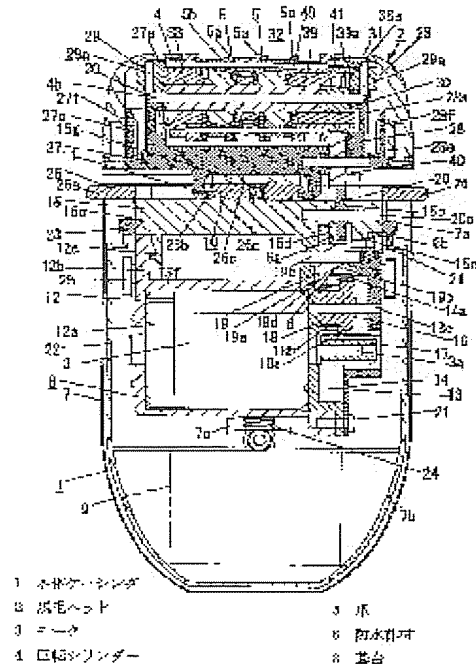
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## (54) DEPILATION DEVICE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a depilation device capable of preventing body hair, sebum, etc., from intruding into a driving source side and preventing malfunction of the driving source and further, capable of simply removing body hair and sebum wound up on a rotary cylinder and stuck to a nail by washing with water.

**SOLUTION:** This depilation device is provided with a body casing 1 having a grip which can be held by a hand and a plurality of nails 5 which grip body hair by opening/closing and further, a rotary cylinder 4 having a hair removal means to remove the hair by the rotary motion, and a driving source to rotate the rotary cylinder 4. A waterproof member 6 sealing the driving source side against the rotary cylinder 4 side is provided in the way of a drive transmission means to transmit a driving force from the driving source to a rotary cylinder 4.



## LEGAL STATUS

[Date of request for examination] 23.06.2003

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3873550

[Date of registration] 02.11.2006

[Number of appeal against examiner's decision]

of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

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## CLAIMS

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[Claim(s)]

[Claim 1] The depilation equipment which prepares the waterproofing member for carrying out the sealing water of the driving source side from a driving source to a rotating-cylinder side to a rotating cylinder in the middle of a drive means of communication for carrying out drive transfer in what was equipped with body casing which has the grasping section which it can have by hand, and two or more pawls which open and close and hold hair, and was equipped with the rotating cylinder which has a depilation means for rotation to draw out hair, and the driving source for rotating a rotating cylinder, and carries out [ changing and ] as the description.

[Claim 2] Depilation equipment according to claim 1 characterized by being constituted by the gear train for transmitting the drive from a driving source to the gearing which a drive means of communication prepared in the rotating cylinder, preparing a waterproofing member in the gear train and growing into it.

[Claim 3] Depilation equipment according to claim 2 characterized by the waterproofing member carrying out the sealing water in the reduction gear part which consists of a main wheel and a pinion.

[Claim 4] Depilation equipment according to claim 2 characterized by unifying the 2nd waterproofing section to which a waterproofing member carries out the sealing water of the separation joint between the pedestals which support a gearing's shaft to revolve to the 1st waterproofing section which carries out a sealing water in a reduction gear part.

[Claim 5] The 1st and 2nd waterproofing section is depilation equipment according to claim 4 which while supports a gearing's shaft to revolve and is characterized by having formed in a pedestal and one.

[Claim 6] Depilation equipment according to claim 2 characterized by having arranged so that a gearing may be fixed to the both sides of the shaft supported to revolve to the pedestal and the sealing water of the waterproofing member may be carried out among both the gearings of this shaft.

[Claim 7] Depilation equipment according to claim 6 with which the gearing fixed to the both sides of a shaft is characterized by consisting of a main wheel and a pinion.

[Claim 8] Depilation equipment according to claim 2 which carries out a sealing water by the waterproofing member in the gear train part built in body casing, and is characterized by the ability of a rotating cylinder to detach and attach freely to body casing.

[Claim 9] Depilation equipment according to claim 2 characterized by carrying out a sealing water to a rotating cylinder by the waterproofing member in a part for the shank of the last stage gearing which does drive transfer.

[Claim 10] Depilation equipment according to claim 1 characterized by attaching the depilation head equipped with the rotating cylinder which the revolving shaft which rotates by the driving

source is transmitted to rotation of a projection and a revolving shaft, and is rotated from body casing which built in the driving source free [ attachment and detachment ] to body casing, and the waterproofing member carrying out the sealing water in a revolving-shaft part.

[Claim 11] Depilation equipment according to claim 10 characterized by preparing the gear train in the depilation head separated from body casing.

[Claim 12] Depilation equipment according to claim 1 characterized by a driving source being a motor.

[Claim 13] Depilation equipment according to claim 2 or 10 characterized by infixing the 2nd waterproofing member between body casing and the up periphery of a pedestal, and coming while carrying out the interior of the pedestal which built in the motor and the gear train which are a driving source to body casing.

[Claim 14] Depilation equipment according to claim 13 characterized by preparing opening to which one of the gearings which constitute the gear train is located in the upper part of a pedestal, and arranging a waterproofing member in the middle of the drive transfer path between the motor within a pedestal, and the gearing located in the above-mentioned opening.

[Claim 15] It is depilation equipment according to claim 14 characterized by preparing the gear train interior section which carries out the interior of the gear train to the motor interior section which carries out the interior of the motor to a pedestal, and a batch changing the motor interior section and the gear train interior section by partition.

[Claim 16] Depilation equipment according to claim 4, 14, or 15 characterized by the pedestal which built in the motor and the gear train which are a driving source combining the pedestal into which plurality was divided.

[Claim 17] Depilation equipment according to claim 16 characterized by constituting the upper part of the pedestal for motor interiors to which a pedestal carries out the interior of the motor, the pedestal for covers for covering a motor, the gearing covering pedestal for covering the gear train in the method of an outside of the pedestal for covers, and the pedestal for motor interiors, the pedestal for covers and a gearing covering pedestal from a wrap top pedestal, and having carried out connection fixing of two or more above-mentioned pedestals.

[Claim 18] Depilation equipment according to claim 17 characterized by constituting the partition which divides the motor interior section and the gear train interior section according to the pedestal for covers.

[Claim 19] Depilation equipment according to claim 18 characterized by changing as the gear train interior section to which the interior of the gear train is carried out in the dead air space which fixed the both ends of a gearing covering pedestal in the condition of having contacted, to the pedestal for covers which is a partition, and was surrounded by the pedestal for covers, and the gearing covering pedestal.

[Claim 20] Depilation equipment according to claim 19 characterized by carrying out opening of the upper part of the gear train interior section which consists of dead air space surrounded by the pedestal for covers, and the gearing covering pedestal, making this opening and opening prepared in the upper pedestal open for free passage, and changing.

[Claim 21] The 2nd waterproofing section to which a waterproofing member carries out the sealing water of the separation joint between the pedestals which support a gearing's shaft to revolve to the 1st waterproofing section which carries out a sealing water in a reduction gear part is unified. Depilation equipment according to claim 4 or 16 characterized by consisting of an annular solid for inserting in the shaft of the boss whom the 1st waterproofing section prepared for the gearing, or a gearing, and consisting of a band-like frame for the 2nd waterproofing section carrying out a sealing water along with the separation joint between pedestals succeeding band-like.

[Claim 22] A suspension wall is projected from an upper pedestal from a projection and a gearing covering pedestal to gear train interior circles to gear train interior circles. A wall A projection, Project with the point of a suspension wall, make a waterproofing member intervene between the points of a wall, project with a suspension wall, and the gear train interior section is divided with a wall and the waterproofing member made to intervene between them into the side in which the output shaft of a motor is located the opening side prepared in the upper pedestal side.

Depilation equipment according to claim 21 characterized by a gearing's boss or a gearing's shaft having penetrated the inside of the hole of the annular solid of a waterproofing member in watertight.

[Claim 23] Depilation equipment according to claim 21 characterized by contacting the lower limit surface part of a suspension wall by pressing in the upper limit side of a waterproofing member, contacting the point of a protrusion wall by pressing on the side face of a waterproofing member, and changing.

[Claim 24] Depilation equipment according to claim 22 characterized by inserting the lower part of an annular solid in the lower semicircle-like insertion section, and changing while inserting in the upper semicircle-like insertion section the upper part of an annular solid which formed the upper semicircle-like insertion section in the lower limit section of a suspension wall, formed the lower semicircle-like insertion section in the point of a protrusion wall, and was established in the waterproofing member.

[Claim 25] Depilation equipment according to claim 21 or 23 characterized by the thing which contacted the lower limit surface part of a suspension wall by pressing in the upper limit side of a waterproofing member, and started to the point of a protrusion wall towards the upper part, and which it starts, the section is prepared, and this standup section is contacted by pressing in the lower limit side of a waterproofing member, and is changed.

[Claim 26] Form the bottom zonite-like sections successively at one in the direction which approaches mutually from the lower limit of the vertical band-like section while turning caudad from the both ends of the U-shaped belt part which carried out the sideways U shape and hanging the vertical band-like section to one, and a band-like frame is constituted. While forming annular solids successively at one between the tips of the bottom zonite-like section which a band-like frame counters, inserting in a suspension wall between the both length band-like sections and contacting a suspension wall by pressing on the inside of the both length band-like section, the both Shimo zonite-like section, and the top face of an annular solid, it contacts by pressing in the upper limit side of a U-shaped belt part around opening of the inferior surface of tongue of an upper pedestal. Depilation equipment according to claim 21 to 25 characterized by contacting the upper limit section of a gearing covering pedestal by pressing on the inferior surface of tongue of a U-shaped belt part while contacting the point of a protrusion wall by pressing in the bottom zonite-like section and the lower limit section of an annular solid, pinching the vertical band-like section and changing by the gearing covering pedestal and the pedestal for covers.

[Claim 27] The convex wall for a partition is projected from the pedestal for covers from a projection and a gearing covering pedestal to gear train interior circles. A wall A projection, Project with the point of the convex wall for a partition, and a waterproofing member is made to intervene between the points of a wall. Depilation equipment according to claim 21 characterized by having projected with the convex wall for a partition, having divided into the side in which the output shaft of a motor is located the opening side which prepared the gear train interior section in the upper pedestal side by the wall and the waterproofing member made to intervene between them, and a gearing's boss or a gearing's shaft having penetrated the inside of the hole of the annular solid of a waterproofing member in watertight.

[Claim 28] Depilation equipment according to claim 27 which turn the point of the convex wall for a partition up, it is made to project, and considers as the vertical partition section, turns the point of a protrusion wall caudad, hangs, considers as the vertical partition section, and is characterized by making the annular solid of a waterproofing member intervene and changing between both the length partition sections.

[Claim 29] The output shaft of the motor which carried out interior to motor interior circles is made to rush into gear train interior circles. Fix a pinion to an output shaft and the main wheel of the 1st reduction gear which has a main wheel and a pinion is engaged. The main wheel of the 2nd reduction gear which has a main wheel and a pinion in the pinion of the 1st reduction gear is engaged. Claim 3 characterized by inserting the annular solid of a waterproofing member in the boss of the part between the main wheel of the 2nd reduction gear, and a pinion, and growing into him, or depilation equipment according to claim 21 to 28.



[Claim 30] The output shaft of the motor which carried out interior to motor interior circles is made to rush into gear train interior circles. Fix a pinion to an output shaft and the main wheel of the 1st reduction gear which has a main wheel and a pinion is engaged. Fix a main wheel and a pinion on both sides of a shaft, constitute the 2nd reduction gear, and the main wheel of the 2nd reduction gear is engaged to the pinion of the 1st reduction gear. Claim 6 characterized by coming to insert the annular solid of a waterproofing member in the part between the main wheel of the shaft of the 2nd reduction gear, and a pinion, claim 7, or depilation equipment according to claim 21 to 28.

[Claim 31] Depilation equipment according to claim 29 or 30 characterized by stationing the gearing for an output which meshes with the pinion of the 2nd reduction gear to the opening circles of an upper pedestal, and growing into them.

[Claim 32] Depilation equipment according to claim 29 or 30 with which the both ends of the shaft of the 1st reduction gear and the shaft of the 2nd reduction gear are characterized by having supported to revolve free [ rotation ] to the pedestal for covers, and the gearing covering pedestal, respectively.

[Claim 33] Depilation equipment according to claim 31 characterized by having supported the both ends of the shaft of the gearing for an output in both the walls section of opening of an upper pedestal.

[Claim 34] Depilation equipment according to claim 8 or 31 characterized by attaching the depilation head which prepared the rotating cylinder free [ attachment and detachment ] to body casing, preparing the gearing for a drive for driving a rotating cylinder on a depilation head, meshing the gearing for a drive free [ attachment and detachment ] on the gearing for an output where body casing is attached in a rotating cylinder, and changing.

[Claim 35] Depilation equipment according to claim 34 characterized by exposing the gearing for a drive in the inferior-surface-of-tongue section of a depilation head, preparing the hook for attaching in the inferior surface of tongue of this depilation head free [ the attachment and detachment to body casing ], making this hook project rather than the exposure location of the gearing for a drive, and changing.

[Claim 36] Depilation equipment according to claim 34 characterized by making the hook anchoring section project and consisting of the exposure location of the gearing for an output which prepared the hook anchoring section for attaching the hook of the inferior-surface-of-tongue section of a depilation head in the top-face section of the upper pedestal which constitutes the top-face section of body casing free [ attachment and detachment ], and has been stationed to opening of an upper pedestal.

[Claim 37] Depilation equipment according to claim 36 characterized by making the method of outside [ hole / which prepared the control unit for canceling a stop with a hook in the hook anchoring section, and prepared this control unit in body casing ] project, and changing.

[Claim 38] Depilation equipment according to claim 37 characterized by infixing the 2nd waterproofing member between body casing and the up periphery of a pedestal while the upper part carries out the interior of the pedestal to body casing which carried out opening, forming the hole which makes a control unit project in the location which shifted to the upper limit opening twist of body casing, and changing from the sealing-water location by the 2nd waterproofing member to it.

[Claim 39] Depilation equipment according to claim 17 characterized by the end section of the upper part of the pedestal for motor interiors and the end section of an upper pedestal being stopped by the stop means, and fixing with a screw-thread implement with common other end of the lower part of the interior pedestal for motors, lower limit section of the pedestal for covers, and lower limit section of a gearing covering pedestal, and for the upper part of a gearing covering pedestal \*\*\*ing to the other end of an upper pedestal, and having fixed it more in detail.

[Claim 40] Depilation equipment according to claim 39 with which each of stop locations by the stop means and fixing locations by the up-and-down screw-thread implement is characterized by making it located in body casing rather than the sealing-water location by the 2nd waterproofing member.

[Claim 41] Depilation equipment according to claim 13 characterized by carrying out fusion of the half-segmented casing to which body casing divided two into perpendicularly and was carried out, constituting, making the 3rd waterproofing member placed between the doubling parts of both half-segmented casing, and changing.

[Claim 42] Depilation equipment according to claim 13 which counters the upper part of the inside section of body casing, and the peripheral face section of an upper pedestal, respectively, forms the 2nd waterproofing member insertion slot, and is characterized by inserting the 2nd outside half section and inside half section of a waterproofing member in the 2nd waterproofing member insertion slot which counters, and growing into it.

[Claim 43] Depilation equipment according to claim 41 characterized by inserting the before [ the 3rd waterproofing member ] side half section, and the backside half section in the 3rd waterproofing member slot insertion slot of half-segmented casing which forms the 3rd waterproofing member insertion slot in the doubling part of half-segmented casing, and counters it forward and backward, and growing into it.

[Claim 44] Counter the upper part of the inside section of body casing, and the peripheral face section of an upper pedestal, respectively, and the 2nd waterproofing member insertion slot is formed. The 2nd outside half section and inside half section of a waterproofing member are inserted in the 2nd waterproofing member insertion slot which counters. The 3rd waterproofing member insertion slot is formed in the doubling part of half-segmented casing. The before [ the 3rd waterproofing member ] side half section and the backside half section are inserted in the 3rd waterproofing member slot insertion slot of half-segmented casing which counters forward and backward. The 2nd waterproofing member insertion slot is made to open the edge of the 3rd waterproofing member insertion slot for free passage. Depilation equipment according to claim 41 characterized by contacting by pressing and growing into the inferior-surface-of-tongue section of the 2nd waterproofing member which inserted in the 2nd waterproofing member insertion slot the edge of the 3rd waterproofing member inserted in the 3rd waterproofing member insertion slot.

[Claim 45] The pedestal for motor interiors to which a pedestal carries out the interior of the motor, and the pedestal for covers for covering a motor, It consists of gearing covering pedestals for covering the gear train in the method of an outside of the pedestal for covers. The protrusion supporter which connection fixing of two or more above-mentioned pedestals was carried out, and was projected from the upper part of the opposite side to the upper part the anchoring side of the pedestal for covers of the pedestal for motor interiors, Depilation equipment according to claim 16 characterized by the thing which projected from the upper part of a gearing covering pedestal to the upper part, and which it projects, and a rotating cylinder is supported enabling free rotation and is changed with a supporter.

[Claim 46] The vertical partition section set up towards the upper part from the pedestal for covers, and the vertical partition section which turned caudad and was installed from the gearing covering pedestal, The dead air space which carried out the interior of the gear train is divided with the vertical partition section constituted by the waterproofing member which intervened between the tips of both the length partition section. The part surrounded by the upside other end and the upside vertical partition section of the pedestal for motor receipt is used as opening. Make a shaft penetrate in watertight the inside of the hole of the annular solid prepared in the waterproofing member, and a gearing is fixed through the vertical partition section at both sides, respectively on this shaft. Depilation equipment according to claim 28 or 45 which considers as the input lateral-tooth vehicle by which one gearing is located in a motor side, and the rotation from a motor is transmitted, and is characterized by locating the gearing of another side in opening circles, and changing as a gearing for an output.

[Claim 47] Depilation equipment according to claim 9 or 46 characterized by gearing and changing with the gearing which prepared the gearing for an output in the rotating cylinder.

[Claim 48] Depilation equipment according to claim 5, 17, or 45 characterized by forming in a gearing covering pedestal at one the waterproofing member which consists of the 1st and 2nd waterproofing section, and changing.

[Claim 49] While carrying out the interior of the pedestal which built in the motor which is a

driving source to body casing, the 2nd waterproofing member is infixed between body casing and the up periphery of a pedestal. Depilation equipment according to claim 10 or 11 characterized by infixing a waterproofing member between the inner skin sections of a hole and the periphery sections of a revolving shaft which inserted the revolving shaft which rotates by the motor in the hole prepared in the upper part of a pedestal, and it was made to project outside, and were prepared in the upper part of this pedestal, and coming.

[Claim 50] Depilation equipment according to claim 11 or 49 characterized by preparing the engaged portion which inserts in while forming the insertion hole for inserting a revolving shaft in the gearing of the start edge of the gear train which prepared the engagement section in the upper limit section of a revolving shaft, and was prepared in the depilation head free [ extraction and insertion ], and engages with the engagement section free [ attachment and detachment ] in a hole, and changing.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the depilation equipment used for removing hair for the purposes, such as cosmetics.

[0002]

[Description of the Prior Art] JP,9-308521,A is known as depilation equipment used for removing hair for the purposes, such as cosmetics, from the former. The conventional example shown in this JP,9-308521,A The roller unit 51 which rotated the motor 3 as is shown in drawing 19 and drawing 20 , and was equipped with two or more disks through the belt 56 is rotated. A disk draws out on both sides of hair, rotating the roller unit 51. Moreover, the cleaning element 53 which consists of a brush of a bristle is formed in casing 52, a cleaning element removes hair collected on the disk which holds and extracts hair, and the hair which he is trying to drop hair on a partition and dropped it is removed by removing covering 54.

[0003] However, although he is trying to remove the hair with which the disk was covered by the cleaning element 53 which consists of a bristle brush if it was in the above-mentioned conventional example, there were problems without enough and removal of hair that removal of sebum was inadequate.

[0004] And rotation of a motor 3 is transmitted to the roller unit 51 through a belt 56 like drawing 19 . Into the part which has arranged this belt 56, the clearance 55 is generated between the roller unit 51 and the motor 3. Since there was a problem that hair and sebum will invade into a motor 3 side from this clearance 55 part and a clearance 55 was generated between the roller unit 51 and a motor 3 still in this way, there was a problem which is roller unit 51 part to which hair and sebum adhered that a rinsing potato could not be carried out.

[0005]

[Problem(s) to be Solved by the Invention] Let it be a technical problem to offer the depilation

equipment which can remove simply the hair which this invention was made in view of the above-mentioned point, neither hair nor sebum could invade into a driving source side, and could prevent failure of a driving source, and coils around a rotating cylinder or has adhered, sebum, or the hair adhering to a pawl and sebum by washing in cold water.

[0006]

[Means for Solving the Problem] The depilation equipment applied to this invention in order to solve the above-mentioned technical problem The rotating cylinder 4 which has the body casing 1 which has the grasping section which it can have by hand, and a depilation means to have two or more pawls 5 which open and close and hold hair, and for rotation draw out hair, a drive means of communication for carrying out drive transfer from a driving source at a rotating cylinder 4 in the thing equipped with the driving source for rotating a rotating cylinder 4 -- on the way -- it is \*\* as the description about forming the waterproofing member 6 for it being alike and carrying out the sealing water of the driving source side to a rotating-cylinder 4 side, and changing. By being able to prevent that hair and sebum invade into a driving source side by the waterproofing member 6, and washing a rotating cylinder 4 and a pawl 5 in cold water by considering as such a configuration the hair (the hair drawn out with hair here --) which coils around a rotating cylinder 4 or has adhered or things, such as hair torn to pieces at the time of drawing, -- saying -- sebum, or the hair and sebum adhering to a pawl 5 can be removed easily, and it can prevent that water infiltrates into a driving source side by the waterproofing member 6 also in this case, and it is convenient even if it washes in cold water.

[0007] Moreover, it is desirable for it to be constituted by the gear train for transmitting the drive from a driving source to the gearing which a drive means of communication prepared in the rotating cylinder 4, and to form the waterproofing member 6 in the gear train. It becomes possible to waterproof with an easy configuration by in rotating a rotating cylinder 4 like before, forming the waterproofing member 6 in the gear train part which transmits a drive to the gearing which prepared in the rotating cylinder 4 compared with what transmits a drive with a belt, and waterproofing into it by considering as such a configuration.

[0008] Moreover, it is desirable that the waterproofing member 6 carries out a sealing water in the reduction gear part which consists of a main wheel and a pinion. The sealing water of the driving source side can be carried out to a rotating-cylinder 4 side in the middle of the gear train with an easy configuration according to being able to attain miniaturization and making the waterproofing member 6 intervene between the main wheel of a reduction gear, and a pinion with constituting a reduction gear from a main wheel and a pinion by considering as such a configuration.

[0009] Moreover, it is desirable to unify the 2nd waterproofing section to which the waterproofing member 6 carries out the sealing water of the separation joint between the pedestals 8 which support a gearing's shaft to revolve to the 1st waterproofing section which carries out a sealing water in a reduction gear part. The sealing water also of the separation joint part between the pedestals 8 which support not only a reduction gear part but a gearing's shaft to revolve with considering as such a configuration by the single waterproofing member 6 in carrying out the sealing water of the driving source side to a rotating-cylinder 4 side in the middle of the gear train can be carried out.

[0010] Moreover, while supports a gearing's shaft to revolve and, as for the 1st and 2nd waterproofing section, having formed in a pedestal 8 and one is desirable. Thus, member mark are reducible by unifying the waterproofing member 6 and one pedestal 8.

[0011] Moreover, it is desirable to have arranged so that a gearing may be fixed to the both sides of the shaft supported to revolve to the pedestal 8 and the sealing water of the waterproofing member 6 may be carried out among both the gearings of this shaft. By considering as such a configuration, it is the easy configuration of carrying out a sealing water by the waterproofing member 6 in a part for the shank between the gearings which fixed to the both sides of the shaft of a reduction gear, and the sealing water of the driving source side can be carried out to a rotating-cylinder 4 side.

[0012] Moreover, it is desirable that the gearing fixed to the both sides of a shaft consists of a main wheel and a pinion. The main wheel and pinion which were fixed to the both sides of a shaft

will constitute a reduction gear, and miniaturization can be attained, and a reduction gear can be constituted from an easy configuration, and the waterproofing member 6 can be made to intervene between a main wheel and a pinion by considering as such a configuration.

[0013] Moreover, it is desirable that a sealing water can be carried out by the waterproofing member 6 in the gear train part built in the body casing 1, and a rotating cylinder 4 can detach and attach freely to the body casing 1. It becomes possible to be able to remove and clean a rotating cylinder 4 from the body casing 1 by considering as such a configuration, and to clean a part of gear train by the side of the body casing 1, and it also becomes possible to remove a rotating cylinder 4 and to wash only a rotating-cylinder 4 side in cold water.

[0014] Moreover, it is desirable to have carried out the sealing water to the rotating cylinder 4 by the waterproofing member 6 in a part for the shank of the last stage gearing which does drive transfer. Washing in cold water can drop hair and sebum on considering as such a configuration easily that what is necessary is to prevent trespassing upon the interior of a part hair and sebum have arranged the gear train, consequently just to mainly clean a rotating-cylinder 4 side in cleaning.

[0015] Moreover, it is desirable that attach the depilation head 2 equipped with the rotating cylinder 4 which the revolving shaft which rotates by the driving source is transmitted to rotation of a projection and a revolving shaft, and is rotated from the body casing 1 which built in the driving source free [ attachment and detachment ] to the body casing 1, and the waterproofing member 6 is carrying out the sealing water in a revolving-shaft part. The sealing water of the driving source side can be carried out to a rotating-cylinder 4 side with the easy configuration of attaching and carrying out the sealing water of the waterproofing member 6 to the revolving shaft by the side of a driving source by considering as such a configuration. The structure of the waterproofing member 6 can be simplified compared with the case where the sealing water of the waterproofing means is attached and carried out to a gear train part. Moreover, that what is necessary is to remove the depilation head 2 in cleaning and just to mainly clean the depilation head 2 side, the rinsing potato depilation head 2 can be removed and the depilation head 2 side can be washed in cold water easily.

[0016] Moreover, it is desirable to have prepared the gear train in the depilation head 2 separated from the body casing 1. By considering as such a configuration, the hair involved in a gear train can be washed out easily.

[0017] Moreover, it is desirable that a driving source is a motor 3. And while carrying out the interior of the pedestal 8 which built in the motor 3 and the gear train which are a driving source to the body casing 1, it is desirable to have infixed the 2nd waterproofing member 23 between the body casing 1 and the up periphery of a pedestal 8. By considering as such a configuration, it can prevent that hair and sebum invade from between the body casing 1 and pedestals by the 2nd waterproofing member 23. Moreover, it can prevent that water infiltrates into the interior from between the body casing 1 and pedestals 8 also when it washes in cold water. Consequently, what is necessary will be just to consider as the structure where only the upper part can carry out water seal of the pedestal 8 which built in a motor 3 and the gear train through the body casing 1 and the 2nd waterproofing member 23, and the structure of parts other than the upper part of a pedestal 8 can be simplified.

[0018] Moreover, it is desirable to prepare opening 15b to which one of the gearings which constitute the gear train is located in the upper part of a pedestal, and to arrange the waterproofing member 6 in the middle of the drive transfer path between the motor 3 within a pedestal and the gearing located in the above-mentioned opening 15b. It can consider as the structure where neither hair nor sebum nor water goes into a motor 3 side by the waterproofing member 6 between a motor 3 and opening 15b of a pedestal 8 by considering as such a configuration.

[0019] Moreover, the gear train interior section 16 which carries out the interior of the gear train to motor interior section 12a which carries out the interior of the motor 3 to a pedestal 8 is formed, and a certain thing of a batch is desirable by partition in motor interior section 12a and the gear train interior section 16. Hair, sebum, water, etc. can be prevented from going into a motor 3 side from a gear train side by partition by considering as such a configuration.

[0020] Moreover, it is desirable that the pedestal 8 which built in the motor 3 and the gear train which are a driving source combines the pedestal 8 into which plurality was divided. By considering as such a configuration, inclusion of the driving source to a pedestal 8 and inclusion of the gear train can be performed easily.

[0021] Moreover, the pedestal 12 for motor interiors to which a pedestal 8 carries out the interior of the motor 3 and the pedestal 13 for covers for covering a motor 3, It is desirable to constitute the upper part of the gearing covering pedestal 14 for covering the gear train in the method of an outside of the pedestal 13 for covers, and the pedestal 12 for motor interiors, the pedestal 13 for covers and the gearing covering pedestal 14 from a wrap top pedestal 15, and to have carried out connection fixing of two or more above-mentioned pedestals 8. By considering as such a configuration, the interior of the motor 3 can be carried out to the pedestal 12 for motor interiors, it can carry out as a motor 3 is covered according to the pedestal 13 for covers, and the gear train is attached between the pedestal 13 for covers, and the gearing covering pedestal 14 and it covers according to the gearing covering pedestal 14 further, and a motor 3 and the gear train can be incorporated easily. And by establishing the upper pedestal 15, the part which carries out a sealing water by the body casing 1 and the 2nd waterproofing member 23 should just carry out in the periphery section of one member called the upper pedestal 15, and can simplify a sealing water with the body casing 1.

[0022] Moreover, it is desirable to constitute the partition which divides motor interior section 12a and the gear train interior section 16 according to the pedestal 13 for covers. By considering as such a configuration, the pedestal 13 for covers which is one of the pedestals divided into three members will serve as a partition, and can simplify structure.

[0023] Moreover, it is desirable to have considered as the gear train interior section 16 to which the interior of the gear train is carried out in the dead air space which fixed where it divided and came out and a certain pedestal 13 for covers is contacted in the both ends of the gearing covering pedestal 14, and was surrounded by the pedestal 13 for covers and the gearing covering pedestal 14. By considering as such a configuration, in carrying out the interior of the gear train to the gear train interior section 16, forming the waterproofing member 6 in the middle of this gear train, and carrying out the sealing water of the motor 3 side by the waterproofing member 6, the sealing water of the perimeter of the gear train interior section 16 divided with waterproofing member 6 part will be surrounded and carried out by the pedestal 13 for covers, and the gearing covering pedestal 14, and sealing-water structure is simplified.

[0024] Moreover, it is desirable to make opening 15b which carried out opening of the upper part of the gear train interior section 16 which consists of dead air space surrounded by the pedestal 13 for covers and the gearing covering pedestal 14, and established it in this opening and the upper pedestal 15 open for free passage. By considering as such a configuration, a part of gear train which carried out interior to the gear train interior section 16 can be located in opening 15b of the upper pedestal 15.

[0025] Moreover, the 1st waterproofing section in which the waterproofing member 6 carries out a sealing water in a reduction gear part, The 2nd waterproofing section which carries out the sealing water of the separation joint between the pedestals which support a gearing's shaft to revolve is unified. It is desirable to consist of annular solid 6a for inserting in the shaft of the boss whom the 1st waterproofing section prepared for the gearing, or a gearing, and to consist of band-like frame 6b for the 2nd waterproofing section to carry out a sealing water along with the separation joint between pedestals 8 succeeding band-like. The sealing water of the separation joint part between the pedestals 8 which could carry out the sealing water in the middle of the gear train and which were divided through band-like frame 6b by considering as such a configuration by inserting annular solid 6a in the shaft of the boss who prepared the gearing, or a gearing can be carried out, and the sealing water in the middle of being this gear train and the sealing water of the separation joint part between pedestals 8 can carry out continuously by one waterproofing member 6.

[0026] A suspension wall is projected from a projection and the gearing covering pedestal 14 to in the gear train interior section 16 in the gear train interior section 16 from the upper pedestal 15. Wall 14a Moreover, a projection, Project with the point of 15d of suspension walls, and the

waterproofing member 6 is made to intervene between the points of wall 14a. It is desirable that projected with 15d of suspension walls, divided into the side in which the output shaft of a motor 3 is located the opening side which formed the gear train interior section 16 in the upper pedestal 15 side by wall 14a and the waterproofing member 6 made to intervene between them, and a gearing's boss or a gearing's shaft has penetrated the inside of the hole of the annular solid of the waterproofing member 6 in watertight. The inside of the gear train interior section 16 can be divided into an opening 15b and motor 3 side with the easy configuration by considering as such a configuration according to sealing-water structure through the waterproofing member 6 at a part for the shank of a gearing's boss or a gearing.

[0027] Moreover, it is desirable to contact the lower limit surface part of 15d of suspension walls by pressing in the upper limit side of the waterproofing member 6, and to contact the point of protrusion wall 14a by pressing on the side face of the waterproofing member 6. By considering as such a configuration, it projects with 15d of suspension walls through the waterproofing member 6, between wall 14a is sealed, and the inside of the gear train interior section 16 can be easily divided with a part for the shank of a gearing's boss or a gearing into an opening 15b and motor 3 side according to sealing-water structure through the waterproofing member 6.

[0028] Moreover, while inserting in upper semicircle-like insertion section 15e the upper part of annular solid 6a which formed upper semicircle-like insertion section 15e in the lower limit section of 15d of suspension walls, formed lower semicircle-like insertion section 14c in the point of protrusion wall 14a, and was established in the waterproofing member 6, it is desirable to insert the lower part of annular solid 6a in lower semicircle-like insertion section 14c. While positioning of annular solid 6a prepared in the waterproofing member 6 is certainly made by considering as such a configuration, the sealing water of annular solid 6a, and 15d of suspension walls and protrusion wall 14a will be made simply.

[0029] Moreover, the thing which contacted the lower limit surface part of 15d of suspension walls by pressing in the upper limit side of the waterproofing member 6, and started to the point of protrusion wall 14a towards the upper part and for which it starts, section 14b is prepared and this standup section 14b is contacted by pressing in the lower limit side of the waterproofing member 6 is desirable. While the waterproofing member 6 starts with 15d of suspension walls, is pinched from the upper and lower sides by section 14b and a positive sealing water is made by considering as such a configuration, anchoring of the waterproofing member 6 can be ensured.

[0030] Moreover, form bottom zonite-like section 6e successively at one in the direction which approaches mutually from the lower limit of 6d of vertical band-like sections while turning caudad from the both ends of U-shaped belt part 6c which carried out the sideways U shape and hanging to one in 6d of vertical band-like sections, and a band-like frame is constituted. Annular solid 6a is formed successively at one between the tips of bottom zonite-like section 6e which a band-like frame counters. While inserting in 15d of suspension walls between 6d of both length band-like sections and contacting 15d of suspension walls by pressing on the inside of 6d of both length band-like sections, both Shimo zonite-like section 6e, and the top face of annular solid 6a, it contacts by pressing in the upper limit side of U-shaped belt part 6c around opening of the inferior surface of tongue of the upper pedestal 15. It is desirable to contact the upper limit section of the gearing covering pedestal 14 by pressing on the inferior surface of tongue of U-shaped belt part 6c, while contacting the point of protrusion wall 14a by pressing in the lower limit section of bottom zonite-like section 6e and annular solid 6a, and to have pinched 6d of vertical band-like sections by the gearing covering pedestal 14 and the pedestal 13 for covers. By considering as such a configuration, you can make it located along with the joint part of the pedestal 8 which divided the waterproofing member 6 into three, the upper pedestal 15, the gearing covering pedestal 14, and the pedestal 13 for covers, with an easy configuration, the waterproofing member 6 can support certainly according to three pedestals, and the sealing water of the joint part of pedestal 8 each can be performed.

[0031] Convex wall 13e for a partition is projected from a projection and the gearing covering pedestal 14 to in the gear train interior section 16 from the pedestal 13 for covers. Wall 14a Moreover, a projection, Project with the point of convex wall 13e for a partition, and the waterproofing member 6 is made to intervene between the points of wall 14a. the side in which



the output shaft of a motor 3 is located the opening side which formed the gear train interior section 16 in the upper pedestal 15 side by the waterproofing member 6 which projected with the convex wall for a partition and was made to intervene wall 14a and between them -- dividing -- the hole of annular solid 6a of the waterproofing member 6 -- it is desirable that a gearing's boss or a gearing's shaft has penetrated inside in watertight. The inside of the gear train interior section 16 can be divided into an opening 15b and motor 3 side with the easy configuration by considering as such a configuration according to sealing-water structure through the waterproofing member 6 at a part for the shank of a gearing's boss or a gearing.

[0032] Moreover, it is desirable to turn the point of convex wall 13e for a partition up, to make it project, and to consider as 13d of vertical partition sections, and to turn the point of protrusion wall 14a caudad, to hang, and for it to be referred to as vertical partition section 14j, and to make annular solid 6a of the waterproofing member 6 intervene between 13d of both length partition sections and 14j. By considering as such a configuration, annular solid 6a of the waterproofing member 6 can be pinched from the upper and lower sides by 13d of vertical partition sections, and vertical partition section 14j, and it can consider as sealing-water structure.

[0033] Moreover, output-shaft 3a of the motor 3 which carried out interior into motor interior section 12a is made to rush in into the gear train interior section 16. Fix a pinion 17 to output-shaft 3a, and the main wheel of the 1st reduction gear which has a main wheel and a pinion is engaged. It is desirable to engage the main wheel of the 2nd reduction gear which has a main wheel and a pinion in the pinion of the 1st reduction gear, and to insert annular solid 6a of the waterproofing member 6 in the boss of the part between the main wheel of the 2nd reduction gear and a pinion. By considering as such a configuration, the sealing water of the waterproofing member 6 can be attached and carried out in the reduction gear part of the direction near a rotating cylinder 4 among two or more reduction gears, and hair, sebum, and water can be prevented from going into the reduction gear side of the side near a motor 3.

[0034] Moreover, output-shaft 3a of the motor 3 which carried out interior into motor interior section 12a is made to rush in into the gear train interior section 16. Fix a pinion 17 to an output shaft and the main wheel of the 1st reduction gear which has a main wheel and a pinion is engaged. It is desirable to fix a main wheel and a pinion on both sides of a shaft, to constitute the 2nd reduction gear, to engage the main wheel of the 2nd reduction gear to the pinion of the 1st reduction gear, and to insert annular solid 6a of the waterproofing member 6 in the part between the main wheel of the shaft of the 2nd reduction gear and a pinion. By considering as such a configuration, the sealing water of the waterproofing member 6 can be attached and carried out in the reduction gear part of the direction near a rotating cylinder 4 among two or more reduction gears, and hair, sebum, and water can be prevented from going into the reduction gear side of the side near a motor 3.

[0035] Moreover, it is desirable to station the gearing 20 for an output which meshes with the pinion of the 2nd reduction gear to the opening circles of the upper pedestal 15. By considering as such a configuration, it is an easy configuration and the output from the gear train prepared in the pedestal side can be performed in opening of the upper pedestal 15 which carried out the sealing water of the periphery section by the 2nd waterproofing member 23 to the body casing 1.

[0036] Moreover, it is desirable to have supported the both ends of the shaft of the 1st reduction gear and the shaft of the 2nd reduction gear to revolve respectively free [ the rotation to the pedestal 13 for covers and the gearing covering pedestal 14 ]. It can perform easily building the 1st reduction gear and the 2nd reduction gear into a pedestal 8, and supporting them by considering as such a configuration.

[0037] Moreover, it is desirable to have supported the both ends of the shaft of the gearing 20 for an output in both the walls section of opening 15b of the upper pedestal 15. By attaching in the upper part of the pedestal 13 for covers and the gearing covering pedestal 14 incorporating the 2nd reduction gear the upper pedestal 15 which attached the gearing for an output in opening by considering as such a configuration, the 2nd reduction gear and gearing 20 for an output can be engaged easily, and the gear train can be assembled.



[0038] Moreover, it is desirable to attach the depilation head 2 which formed the rotating cylinder 4 free [ attachment and detachment ] to the body casing 1, to form the gearing 40 for a drive for driving a rotating cylinder 4 on the depilation head 2, and to mesh the gearing 40 for a drive free [ attachment and detachment ] on the gearing 20 for an output, where the body casing 1 is attached in a rotating cylinder 4. In detaching and attaching the depilation head 2 which formed the rotating cylinder 4 to the body casing 1 by considering as such a configuration Can transmit rotation of a motor 3 to a rotating cylinder 4 with an easy configuration, can rotate a rotating cylinder 4, and, moreover, in cleaning Also in case cleaning is possible to all the corners and it washes in cold water by removing the depilation head 2, it also becomes possible to remove the depilation head 2 and to wash only the depilation head 2 side in cold water.

[0039] Moreover, it is desirable to expose the gearing 40 for a drive in the inferior-surface-of-tongue section of the depilation head 2, to form the hook 11 for attaching in the inferior surface of tongue of this depilation head 2 free [ the attachment and detachment to the body casing 1 ], and to make this hook 11 project rather than the exposure location of the gearing 40 for a drive. By considering as such a configuration, when the depilation head 2 is removed, the gearing 40 for a drive will be located inside a hook, and can prevent that the gearing 40 for a drive is damaged in other objects.

[0040] Moreover, it is more desirable than the exposure location of the gearing 20 for an output which formed the hook anchoring section 10 for attaching the hook 11 of the inferior-surface-of-tongue section of the depilation head 2 in the top-face section of the upper pedestal 15 which constitutes the top-face section of the body casing 1 free [ attachment and detachment ], and has been stationed to opening 15b of the upper pedestal 15 to make the hook anchoring section 10 project. By considering as such a configuration, when the depilation head 2 is removed, the gearing 20 for an output will be located inside the hook anchoring section 10, and can prevent that the gearing 20 for an output is damaged in other objects.

[0041] Moreover, it is desirable to make the method of outside [ hole / which prepared control unit 26a for canceling a stop with hook 11 in the hook anchoring section 10, and prepared this control unit 26a in the body casing 1 ] project. Considering as such a configuration can cancel a stop with the hook anchoring section 10 and hook 11 of the hole of the body casing 1 easily by operating control unit 26a projected to the method of outside.

[0042] Moreover, while the upper part carries out the interior of the pedestal to the body casing 1 which carried out opening, the 2nd waterproofing member 23 is infixed between the body casing 1 and the up periphery of a pedestal 8, and it is more desirable than the sealing-water location by the 2nd waterproofing member 23 to form the hole which makes control unit 26a project in the location which shifted to the upper limit opening twist of the body casing 1. Even if hair, sebum, and water enter in the body casing 1 by considering as such a configuration from the hole which makes control unit 26a project, it does not go into the part to which this hair, sebum, and water carried out the interior of the motor 3 of the body casing 1.

[0043] Moreover, it is desirable for the end section of the upper part of the pedestal 12 for motor interiors and the end section of the upper pedestal 15 to be stopped by the stop means, and to fix with the screw-thread implement 21 with common other end of the lower part of the interior pedestal for motors 3, lower limit section of the pedestal 13 for covers, and lower limit section of the gearing covering pedestal 14, and for the upper part of the gearing covering pedestal 14 to \*\*\*\* to the other end of the upper pedestal 15, and to have fixed it with the ingredient 21. By considering as such a configuration, assembly fixing of the pedestal 12 for motor interiors and the pedestal 13 for covers which were trichotomized, and the gearing covering pedestal 14 can be carried out easily.

[0044] Moreover, it is more desirable than the sealing-water location according [ each of stop locations by the stop means and fixing locations by the up-and-down screw-thread implement 21 ] to the 2nd waterproofing member 23 that you make it located in the body casing 1. Thus, the structure of assembly fixing of a pedestal 8 where the assembly fixing location of the pedestal 12 for motor interiors, the pedestal 13 for covers, and gearing covering which were divided did not need to take into consideration invasion prevention of the hair or sebum from a stop or a fixing part, or water, and was divided rather than the 2nd waterproofing member 23

because it is in the body casing 1 is simplified.

[0045] Moreover, fusion of the half-segmented casing 7 to which the body casing 1 divided two into perpendicularly, and was carried out is carried out, it constitutes, and it is desirable to make the 2nd waterproofing member 23 placed between the doubling parts of both the half-segmented casing 7. Thus, in spite of being the configuration which could incorporate the pedestal to the interior etc. easily, and broke two, and was carried out with carrying out fusion of the half-segmented casing 7, and constituting the body casing 1, it can prevent the 2nd waterproofing member 23 certainly by intervening that hair, sebum, and water trespass upon the interior of the body casing 1 from the doubling part of the half-segmented casing 7.

[0046] Moreover, the upper part of the inside section of the body casing 1 and the peripheral face section of the upper pedestal 15 are countered, respectively, the 2nd waterproofing member insertion slot 15a and 7a is formed, and it is desirable to insert the 2nd outside half section and inside half section of the waterproofing member 23 in the 2nd waterproofing member insertion slot 15a and 7a which counters. By considering as such a configuration, it hits carrying out water seal of the inside section of the body casing 1, and the peripheral face section of the upper pedestal 15 by the 2nd waterproofing member 23. It can attach, where the 2nd waterproofing member 23 is positioned to the body casing 1 and the upper pedestal 15. By this To the body casing 1, positioning support can be carried out through the 2nd waterproofing member 23, vibration of the motor 3 built in the pedestal 8 decreases a pedestal 8 by the 2nd waterproofing member 23, and it is made as for it to propagation in a pile configuration at the body casing 1 side.

[0047] Moreover, it is desirable to insert the before [ the 2nd waterproofing member 23 ] side half section and the backside half section in 2nd waterproofing member insertion slot 7b of the half-segmented casing 7 which forms 3rd waterproofing member insertion slot 7b in the doubling part of the half-segmented casing 7, and counters it forward and backward. By considering as such a configuration, the 2nd waterproofing member 23 can be positioned to the position of the half-segmented casing 7, and alignment of the half-segmented casing 7 comrades can be carried out by exact physical relationship through the 2nd waterproofing member 23 positioned in this way.

[0048] The upper part of the inside section of the body casing 1 and the peripheral face section of the upper pedestal 15 are countered, respectively. Moreover, 2nd waterproofing member insertion slot 15a, Form 7a and the 2nd outside half section and inside half section of the waterproofing member 23 are inserted in the 2nd waterproofing member insertion slot 15a and 7a which counters. 3rd waterproofing member insertion slot 7b is formed in the doubling part of the half-segmented casing 7. The before [ the 2nd waterproofing member 23 ] side half section and the backside half section are inserted in 2nd waterproofing member slot insertion slot 7a of the half-segmented casing 7 which counters forward and backward. 2nd waterproofing member insertion slot 7a is made to open the edge of 3rd waterproofing member insertion slot 7b for free passage. It is desirable to contact by pressing the edge of the 2nd waterproofing member 23 inserted in 2nd waterproofing member insertion slot 7b in the inferior-surface-of-tongue section of the 2nd waterproofing member 23 inserted in 2nd waterproofing member insertion slot 7a. By considering as such a configuration, the sealing water of the doubling part of the half-segmented casing 7 and the part between the inner circumference section of the body casing 1 and the peripheral face section of the upper pedestal 15 can be continuously carried out by the 2nd waterproofing member 23 and the 3rd waterproofing member 22.

[0049] Moreover, the pedestal 12 for motor interiors to which a pedestal 8 carries out the interior of the motor 3 and the pedestal 13 for covers for covering a motor 3, It consists of gearing covering pedestals 14 for covering the gear train in the method of an outside of the pedestal 13 for covers. The thing which connection fixing of two or more above-mentioned pedestals was carried out, and projected from the upper part of the opposite side to the upper part the anchoring side of the pedestal 13 for covers of the pedestal 12 for motor interiors, which projected and projected from a supporter and the upper part of the gearing covering pedestal 14 to the upper part and for which it projects and a rotating cylinder 4 is supported free [ rotation ] with a supporter is desirable. Inclusion of a motor 3, the gear train, and a rotating

cylinder 4 can be easily performed by carrying out the interior of a motor 3 and the gear train, being able to constitute the pedestal supported for a rotating cylinder 4, enabling free rotation from an easy configuration, and dividing this pedestal into two or more pedestals by considering as such a configuration.

[0050] Moreover, the vertical partition section set up towards the upper part from the pedestal 13 for covers, The dead air space which carried out the interior of the gear train is divided with the vertical partition section which turned caudad and was installed from the gearing covering pedestal 14, and the vertical partition section constituted by the waterproofing member 6 which intervened between the tips of both the length partition section. The part surrounded by the upside other end and the upside vertical partition section of the pedestal for motor 3 receipt is used as opening. Make a shaft penetrate inside in watertight and a gearing is fixed through the vertical partition section at both sides, respectively on this shaft. the hole of annular solid 6a prepared in the waterproofing member 6 -- It is desirable to consider as the input lateral-tooth vehicle 44 by which one gearing is located in a motor 3 side, and the rotation from a motor 3 is transmitted, to locate the gearing of another side in opening circles, and to consider as the gearing 20 for an output. Hair, sebum, and water can be prevented from entering inside a vertical partition by dividing the middle of the gear train with the vertical partition section in watertight by considering as such a configuration. By moreover, the thing for which the other side is located in opening circles and serves as the gearing 20 for an output among the gearings located in both sides through the vertical partition section What is necessary is to clean only the gearing 20 for an output which neither hair nor sebum nor water goes into the gear train by the side of a motor 3 rather than the gearing 20 for an output located in an opening part, and is located in opening, and cleaning becomes easy.

[0051] Moreover, it is desirable to gear with the gearing which formed the gearing 20 for an output in the rotating cylinder 4. By considering as such a configuration, there is no gearing in addition to the gearing which prepared in the depilation head 2 side at the rotating cylinder 4, and cleaning by the side of the depilation head 2 can be performed easily.

[0052] Moreover, it is desirable to form in the gearing covering pedestal 14 at one the waterproofing member 6 which consists of the 1st and 2nd waterproofing section. Thus, inclusion of the waterproofing member 6 is made to coincidence by being able to reduce member mark by unifying the waterproofing member 6 and the gearing covering pedestal 14, and incorporating the gearing covering pedestal 14.

[0053] Moreover, while carrying out the interior of the pedestal which built in the motor 3 which is a driving source to the body casing 1, the 2nd waterproofing member 23 is infixed between the body casing 1 and the up periphery of a pedestal 8. It is desirable to infix the waterproofing member 6 between the inner skin sections of a hole and the periphery sections of a revolving shaft 45 which inserted the revolving shaft 45 which rotates by the motor 3 in the hole prepared in the upper part of a pedestal, and it was made to project outside, and were prepared in the upper part of this pedestal 8. By considering as such a configuration, waterproofing of the revolving shaft 45 which waterproofing between the body casing 1 and the up periphery of a pedestal 8 can be performed by the 2nd waterproofing member 23, and projects from the hole of a pedestal by the waterproofing member 6 can be performed, and the sealing water of the motor 3 which this built in the pedestal can be certainly carried out to a rotating-cylinder 4 side. And it is not necessary to take water seal etc. into consideration, and the structure of inclusion of the motor 3 to a pedestal 8 can be simplified in built-in of the motor 3 to a pedestal by forming the 2nd waterproofing member 23.

[0054] Moreover, it is desirable to prepare engaged portion 48a which inserts in while forming the insertion hole for inserting a revolving shaft 45 in the gearing 48 of the start edge of the gear train which prepared the engagement section in the upper limit section of a revolving shaft 45, and was prepared in the depilation head 2 free [ extraction and insertion ], and engages with engagement section 45a free [ attachment and detachment ] in a hole. Where it could detach and attach the depilation head 2 easily and the depilation head 2 is attached by considering as such a configuration, rotation of a revolving shaft 45 can be certainly transmitted to the gearing 48 of the start edge of the gear train prepared in the depilation head 2 because engagement

section 45a engages with engaged portion 48a.

[0055]

[Embodiment of the Invention] Hereafter, this invention is explained based on the operation gestalt shown in an accompanying drawing.

[0056] The depilation equipment of this invention is equipped with the depilation head 2 which has a depilation means for carrying out depilating of the hair to the body casing 1 which can be grasped by hand, the motor 3 which is a driving source is built in the body casing 1, and the rotating cylinder 4 equipped with the depilation means is attached in the depilation head 2. \*\* which is the depilation means formed in the rotating cylinder 4 being equipped with two or more pawls 5 which open and close and hold hair, it constituting them so that hair's may be pinched by rotation and it may draw out, and transmitting rotation of a motor 3 to a rotating cylinder 4 with a drive means of communication, and rotating a rotating cylinder 4, pinches hair with a depilation means and is drawn out -- it is like. and the gear train which is a drive means of communication for carrying out drive transfer in this invention at a rotating cylinder 4 from the motor 3 which is a driving source -- on the way -- considering as the structure where the waterproofing member 6 for it being alike and carrying out the sealing water of the motor 3 side to a rotating-cylinder 4 side is formed, and neither hair nor sebum nor water goes into a motor 3 side, and the waterproofing structure where water does not go into a motor 3 side especially -- washing in cold water -- possible -- making .

[0057] First, based on drawing 1 thru/or drawing 10 , it explains per 1 operation gestalt of this invention. As shown in drawing 1 , drawing 3 , drawing 4 , and drawing 5 , the body casing 1 fuses with order the half-segmented casing 7 which carried out 2 rates, and is constituted in it, the interior of the pedestal 8 which built in the gear train which the body casing 1 is that in which upper limit carried out opening, and are a motor 3 and a drive means of communication has been carried out into the body casing 1, and the interior of the dry cell or battery charger 9 for driving a motor 3 in the body casing 1 has been carried out further.

[0058] It enables it to attach the depilation head 2 free [ attachment and detachment ] to the body casing 1 by attaching in the hook anchoring section 10 the hook 11 of the pair which the top-face section of a pedestal 8 has plugged up upper limit opening of the body casing 1, has formed the hook anchoring section 10 in the top-face section of this pedestal 8, and was prepared in the inferior-surface-of-tongue section of the depilation head 2 free [ attachment and detachment ].

[0059] Constitute the pedestal 8 combining the pedestal into which plurality was divided, and it is set in this operation gestalt. The pedestal 12 for motor interiors to which a pedestal 8 carries out the interior of the motor 3, and the pedestal 13 for covers for covering a motor 3, The upper part of the gearing covering pedestal 14 for covering the gear train in the method of an outside of the pedestal 13 for covers, and the pedestal 12 for motor interiors, the pedestal 13 for covers and the gearing covering pedestal 14 consists of wrap top pedestals 15.

[0060] Upward protruding piece 12b projected to the upper part constitutes the pedestal 12 for motor interiors from the end section of the top-face section of motor interior section 12a which carried out the U shape as shown in drawing 5 , and motor interior section 12a, and stop section 12c is prepared in upward protruding piece 12b. From opening of the side, a motor 3 is inserted in and interior is carried out to motor interior section 12a which carried out the U shape. The pedestal 13 for covers is attached in side opening of motor interior section 12a which carried out the U shape. Furthermore, the gearing covering pedestal 14 is attached in the outside of the pedestal 13 for covers. The dead air space surrounded by the pedestal 13 for covers and the gearing covering pedestal 14 serves as the gear train interior section 16, and a batch has motor interior section 12a and the gear train interior section 16 according to the pedestal 13 for covers.

[0061] Output-shaft 3a of the motor 3 by which interior was carried out to motor interior section 12a divides and comes out, hole 13a of a certain pedestal 13 for covers is \*\*\*\*(ed), it has projected in the gear train interior section 16, and the pinion 17 is fixed into the part projected in the gear train interior section 16 of this output-shaft 3a. In motor interior section 12a, two or more reduction gears 18 and 19 are formed. Reduction gears 18 and 19 all consist of

main wheels 18a and 19a and pinions 18b and 19b, and the both ends of the shafts 18c and 19c of each reduction gears 18 and 19 are supported to revolve to the hole prepared in the pedestal 13 for covers, and the pedestal 14 for gearing covering, respectively. Main wheel 18a of a reduction gear 18 has geared to the pinion 17, the reduction gear 19 is arranged above the reduction gear 18, and main wheel 19a of a reduction gear 19 has geared to pinion 18b of a reduction gear 18. between main wheel 19a of a reduction gear 19, and pinion 19b — pinion 19b and the diameter of said — or boss 19d of a major diameter is prepared.

[0062] Over the both-sides edge of the outside section (that is, field by the side of the gearing covering pedestal 14) and the lower limit section of the pedestal 13 for covers, in the shape of U character, rib 13b has protruded and step 13c is prepared in the both-sides upper part of rib 13b which carried out the shape of this U character.

[0063] As shown in drawing 7, the inside section (that is, field by the side of the pedestal 13 for covers) of the gearing covering pedestal 14 serves as a hollow. Project sideways and wall 14a is provided so that a hollow may be divided into the upper part of the hollow of the gearing covering pedestal 14 up and down at 14d of upper hollows, and bottom hollow 14e. Start to the point of this protrusion wall 14a, have formed section 14b, and lower semicircle-like insertion section 14c cut in the center section of standup section 14b in the shape of a semicircle is formed. As the abbreviation lower half of lower semicircle-like insertion section 14b projects, it is caudad located rather than the apical surface of wall 14a and it is shown in drawing 7, it projected in the part in the lower half of [ abbreviation ] lower semicircle-like insertion section 14b, and the apical surface of wall 14a is exposed. Moreover, it started except for the abbreviation lower half of lower semicircle-like insertion section 14b, and other parts of section 14b are projected more nearly up than the top face of protrusion wall 14a. Although 14g of both-sides walls of 14d of upper hollows has also projected the both-sides corkscrew twist of bottom hollow 14e towards the pedestal 13 side for covers, they started and section 14b has projected them to the pedestal 13 side for covers further rather than 14g of both-sides walls of 14d of upper hollows. And while inserting in step 13c of the pedestal 13 for covers the part which projected this standup section 14b, the part below step 13c of U character-like rib 13b is contacted in the periphery edge surface of bottom hollow 14e. Moreover, 14f of positioning crevices is formed in the inside of the side-attachment-wall section of standup section 14b of upper hollow 14e, and the opposite side.

[0064] The inside half section of the 2nd waterproofing member 23 in which the upper pedestal 15 has the elasticity which the appearance is carrying out the almost same configuration as upper limit opening of the body casing 1, has formed 2nd waterproofing member insertion slot 15a in the periphery section, and made the shape of a ring this 2nd waterproofing member insertion slot 15a is inserted in. As shown in drawing 5, while having prepared opening 15b in one flank of the upper pedestal 15 and installing fixed piece 15c outside on both sides of opening 15b at the inferior-surface-of-tongue section of the upper pedestal 15, 15d of suspension walls is installed inside. Upper semicircle-like insertion section 15e which carried out the shape of an abbreviation semicircle is formed in the center section of the lower limit section of 15d of suspension walls. Moreover, 15f of locked members is formed in the edge of the opposite side of the edge of the direction which hung fixed piece 15c of the inferior-surface-of-tongue section of the upper pedestal 15. Moreover, it has protruded on the top-face section center section of the upper pedestal 15 in 15g of projected parts for a tunnel which have a tunnel path towards the upper part, 15h of holes is prepared in the center section of the top-face section of 15g of projected parts for a tunnel, and support protruding piece 15i has protruded on the both ends of the direction which intersects perpendicularly with the tunnel path of the top-face section of 15g of projected parts for a tunnel towards the upper part. Moreover, the gearing 20 for an output is stationed in opening 15b, and shaft 20a of the gearing 20 for an output is supported to revolve in both the walls section of opening 15b.

[0065] It \*\*\*\*s from the gearing covering pedestal 14 side to the hole which prepared the lower limit section of the pedestal 12 for motor interiors, the lower limit section of the pedestal 13 for covers, and the lower limit section of the gearing covering pedestal 14 in each lower limit section, and an ingredient 21 is inserted and it fixes. Moreover, the upper pedestal 15 is arranged

so that the upper limit section of the pedestal 12 for motor interiors, the upper limit section of the pedestal 13 for covers, and the upper limit section of the gearing covering pedestal 14 may be covered. 15f of locked members prepared in stop section 12c prepared in the pedestal 12 for motor interiors at the upper pedestal 15 is stopped. Furthermore, where it inserted fixed piece 15c of the upper pedestal 15 in 14f of positioning crevices of the gearing covering pedestal 14 and it is positioned, the gearing covering pedestal 14 and fixed piece 15c are \*\*\*\*\*ed, and it fixes with an ingredient 21.

[0066] Here, in this invention, the hair and sebum which formed the waterproofing member 6 in the middle of, and entered from opening 15b of the upper pedestal 15, and water prevent going into a motor 3 side. [ the gear train which is a drive means of communication ]

[0067] The waterproofing member 6 has elasticity, as it shows the configuration to drawing 7, it unifies the 1st waterproofing section which carries out a sealing water in a reduction gear part, and the 2nd waterproofing section which carries out the sealing water of the separation joint between the divided pedestals, and an elastic body like rubber constitutes. Annular solid 6a for inserting in the shaft of the boss who prepared the gearing, or a gearing constitutes the 1st waterproofing section, and band-like frame 6b for carrying out a sealing water along with the separation joint between pedestals 8 succeeding band-like constitutes the 2nd waterproofing section. From a lower limit of 6d of vertical band-like sections, in the direction which approaches mutually, band-like frame 6b forms bottom zonite-like section 6e successively to one, and is constituted while it is caudad turned from the both ends of U-shaped belt part 6c which carried out the sideways U shape and hangs to one in 6d of vertical band-like sections. The waterproofing member 6 is formed by forming annular solid 6a successively to one at one between the tips of bottom zonite-like section 6e which band-like frame 6b counters.

[0068] Carry out a deer and the waterproofing member 6 of the above-mentioned configuration inserts the hole of annular solid 6a in boss 19d of a reduction gear 19 in watertight. Press pinching of the U-shaped belt part 6c is carried out from the upper and lower sides in the top face of 14g of side attachment walls of 14d of upper hollows which are the upper limit side of the gearing covering pedestal 14, and the part around opening 15b of the inferior-surface-of-tongue section of the upper pedestal 15. Press pinching of the 6d of the vertical band-like sections is carried out in respect of the side edge of 14g of side attachment walls of 14d of upper hollows of the step 13c part of rib 13b of the pedestal 13 for covers, and the gearing covering pedestal 14. Start with the lower limit side of 15d of suspension walls of the upper pedestal 15 which inserted in bottom zonite-like section 6e exactly without the clearance between 6d of vertical band-like sections, and press pinching is carried out on the top face of section 14b. The upper half and lower half of annular solid 6a are inserted in upper semicircle-like insertion section 15e and lower semicircle-like insertion section 14c, from the upper and lower sides, press pinching is carried out, it projects on the side face of the lower part of annular solid 6a further, and the apical surface of wall 14a is contacted by pressing. Thus, although the waterproofing member 5 is attached, the perspective view of a part which made the waterproofing member 6 which carried out in this way and was attached in drawing 6 placed between the joint parts of the gearing covering pedestal 14, the pedestal 13 for covers, and the upper pedestal 15 is shown.

[0069] Thus, the inside of the gear train interior section 16 will be divided into the motor 3 and opening 15b side with protrusion wall 14a which starts with 15d of suspension walls by attaching the waterproofing member 6, and has section 14b, and the waterproofing member 6 which intervenes between them in watertight bordering on the boss 19d part of a reduction gear 19. And main wheel 19a of a reduction gear 19 was located in bottom hollow 14e and the dead air space opened for free passage, and pinion 19b of a reduction gear 19 was located in 14d of upper hollows, and it was located directly under opening 15b, and has geared with the gearing 20 for an output which arranged in opening 15b. Therefore, it will be prevented that the hair and sebum which entered from opening 15b, and water go into the interior more than it by the waterproofing member 6.

[0070] For carrying out the interior of the pedestal 8 which built in the gear train to a motor 3 into the body casing 1 of 2 rates as mentioned above, it is carried out by [ as being the following ].

[0071] 2nd waterproofing member insertion slot 7a is formed in the upper part of the inside section of the half-segmented casing 7 over the longitudinal direction of the inside section. Furthermore, along with the doubling part of the half-segmented casing 7, 3rd waterproofing member insertion slot 7b is formed in the shape of U character, and both the upper limit section of 3rd waterproofing member insertion slot 7b which carried out the shape of U character is open for free passage to the lower limit of 2nd waterproofing member insertion slot 7a. Although it \*\*\*\*\* where the before [ the 3rd waterproofing member 22 ] side half section and the backside half section are inserted in and doubled with 3rd waterproofing member insertion slot 7a which counters forward and backward, and both the half-segmented casing 7 is fused more in detail and the body casing 1 is constituted in case the half-segmented casing 7 which counters forward and backward is fused In this case, arrange the pedestal which built in a motor 3 and the gear train inside, and the outside half section of the 2nd waterproofing member 23 attached in the periphery section of the upper pedestal 15 is inserted in 2nd waterproofing member insertion slot 7a of both the half-segmented casing 7. Both the upper limit section of the 3rd waterproofing member 22 which carried out the shape of U is contacted by pressing in the lower limit side of the 2nd waterproofing member 23, respectively. It is and the sealing water between the inside section of the fusion part of the half-segmented casing 7 and the body casing 1 and the peripheral face section of the upper pedestal 15 is continuously performed by the 3rd waterproofing member 22 and the 2nd waterproofing member 23.

[0072] There is no part which is open for free passage inside except opening 15b which established the pedestal by considering as such a configuration at the upper pedestal 15 in the body 1 which carried out interior, and, moreover, hair, sebum, water, etc. enter more than it by the waterproofing member 6 near the opening 15b in a pedestal 8 at a motor 3 side.

[0073] Although the pedestal is elastically supported to the body casing 1 in the periphery part of the upper pedestal 15 as mentioned above here by the 2nd waterproofing member 23 which has elasticity The inferior-surface-of-tongue section of a pedestal (pedestal 12 for motor interiors) is elastically supported by the spring material 24 supported to spring supporter 7c further prepared in the half-segmented casing 7. Moreover, the housing 25 is attached in the interior of one half-segmented casing 7 because hole 25a of the housing 25 which made the U shape 7d of projections caudad prepared rather than 2nd waterproofing member insertion slot 15a in the half-segmented casing 7 inserts in. Piece of connection 25b which has elasticity into the part which made the shape of U character the piece of both sides of the U-shaped housing 25, and which cut deeply, formed and cut the slot deeply and was surrounded by the slot is formed. It has inserted in and attached in 14h of anchoring projections which prepared the hole prepared in this piece 25 of connection, respectively in the external surface of the gearing covering pedestal 14 and the pedestal 12 for motor interiors, and, thereby, elastic support of the pedestal 8 has been further carried out to the body casing 1 between the 2nd waterproofing member 23 and the spring material 24. The pedestal 8 which carried out the interior of the motor 3 by this is elastically supported by the housing 25 which has the 2nd waterproofing member 23, the spring 24, and elastic piece 25b which have elasticity, and vibration of a motor 3 is propagation-hard and is made into the body casing 1 side.

[0074] On both sides of the top-face section of the upper pedestal 15, the slide frame 26 is arranged free [ a slide ], control unit 26a has protruded towards the method of an outside from the piece section of an outside of the slide frame 26 which carried out the plane view abbreviation rectangle, support hook 26b has protruded on the inside of the piece section of the inside of the slide frame 26, and projected part 26c for stoppers is further projected towards the upper part on the top face of the piece section of the inside of the slide frame 26.

[0075] As shown in drawing 1 , the inside part of both the slide frame 26 is inserted in free [ a slide ] in the tunnel path of 15g of projected parts for a tunnel, it has inserted in free [ a slide ] in 15h of holes which prepared projected part 26c for stoppers in the top-face section of 15g of projected parts for a tunnel, and the slide frame 26 falls out by hitting the edge whose projected part 26c for stoppers is 15h of holes. Spring 26d is infixed between both the slide frames 26 into the tunnel path of 15g of projected parts for a tunnel, both the slide frame 26 is turned outside by spring 26d, and elastic energization is carried out. And the hook anchoring section consists of



projected part 26c for a tunnel, and both slide frame 26. Moreover, control unit 26a of both the slide frame 26 is inserted in hole 7e prepared in the body casing 1, and makes the method of an outside [ casing / 1 / body ] have projected.

[0076] The depilation head 2 consists of the rotating cylinder 4 equipped with the depilation means, the cylinder anchoring pedestal 27, cylinder cover 28, a cam 29, a maintenance spring 30, and a head frame 31, as shown in drawing 1 , drawing 2 , and drawing 8 .

[0077] As a rotating cylinder 4 is shown in drawing 9 , two or more crevice (spacing of 36 degrees is kept with operation gestalt, and they are ten places) 4a is formed in the circumferencial direction. In the both ends of hollow 4a, fixed pawl 5b is projected, respectively, and the hole five b1 is formed in fixed pawl 5b which protruded on the both ends of this hollow 4a. Moreover, the subject unit 32 for depilation is inserted in in crevice 4a.

[0078] The subject unit 32 for depilation consists of the supporting-point plate 33, movable pawl 5a of plurality (an operation gestalt four sheets), the supporting-point stop member 34, a spring receptacle member 35, a transfer lever 36, and a spring 37, as shown in drawing 9 . The supporting-point plate 33 prepares square hole 33a for spring receptacle insertion in a center section, square hole 33b for rib insertion is prepared in both sides, and square hole 33c for movable pawl insertion is formed in the method of the outside of an angle of square hole 33b for both rib insertion, respectively between square hole 33a for spring receptacle insertion, and square hole 33b for both rib insertion.

[0079] The supporting-point stop member 34 is received in a center section, insertion hole 34a is prepared, fixed pawl 5b has protruded on the upper part from the both sides of spring receptacle insertion hole 34a, and rib 34b which became a lot by two pieces, respectively turns to the both sides of the inferior-surface-of-tongue section of the supporting-point stop member 34 caudad, and is installed in them, and long hole 34c is prepared in rib 34b. Moreover, 34d of holes is prepared in the supporting-point stop member 34 at the longitudinal direction. And this supporting-point stop member 34 is constructed one by two of both sides, and is inserted in square hole 33c for rib insertion of the both sides of the supporting-point plate 33 in \*\*\*\*\* rib 34b.

[0080] Hole 35a is prepared in the upper part at the spring receptacle member 35, and spring insertion hole 35b is prepared in the lower part. And the spring receptacle member 35 is inserted in spring receptacle insertion hole 34a of the supporting-point stop member 34, and square hole 33a for spring receptacle insertion of the supporting-point plate 33. Moreover, the hole five a1 is formed in movable pawl 5a, and among movable pawl of four sheets 5a, movable pawl of two sheets 5a inserts in spring receptacle insertion hole 34b from between fixed pawl 5b and the spring receptacle members 35 which protruded on the supporting-point stop member 34, and is further inserted in square hole 33b for movable pawl insertion of the both sides of square hole 33a for spring receptacle insertion of the supporting-point plate 33. Moreover, other movable pawl of two sheets 5a is inserted in square hole 33b for movable pawl insertion of the both ends of the supporting-point plate 33. Moreover, engagement projected part 36b which has inserted protruding piece 36a of the upper part of the transfer lever 36 in rib 34b used as a lot by two pieces, respectively, and was prepared in protruding piece 36a has engaged with long hole 34c of rib 34b free [ a slide ]. One transfer lever 36 intervenes between the lower parts of movable pawl of two sheets 5a by the side of one, and the transfer lever 36 of another side has intervened between the lower parts of movable pawl of two sheets 5a of the side else. Moreover, the spring 37 inserted in spring insertion hole 35b prepared in the spring receptacle member 35 is \*\*\*\*(ing) to the lower inside of both movable pawl 5b of a center section.

[0081] The subject unit 32 for depilation is assembled as one unit as mentioned above. And this subject unit 32 for depilation is inserted in each crevice 4a of a rotating cylinder 4. A shaft 49 is inserted from the hole five b1 prepared in fixed pawl 5b prepared in one edge of crevice 4a. Hole 35a of the hole of 34d of the supporting-point stop member 34, each hole three a1 of movable pawl 5a of four sheets, and the spring receptacle member 35 is inserted in, the point of this shaft 49 is inserted in the hole five b1 of fixed pawl 5b of the other end of crevice 4a, and the subject unit 32 for depilation is attached in crevice 4a.

[0082] As shown in drawing 9 , two or more hole 4b is formed in the both-ends surface part of



the shaft orientations of a rotating cylinder 4 in the hoop direction. The closing motion lever 38 and the closing motion lever 39 are inserted in two or more hole 4b prepared in the end surface part of the shaft orientations of a rotating cylinder 4 by turns in the hoop direction. Press section 38a of the edge of the closing motion lever 38 is shifted and located inside the direction of a path of a rotating cylinder 4 rather than press section 39a of the edge of the closing motion lever 39. In the hoop direction, the both ends of press section 38a have lapped [ the press sections 38a and 39a which have shifted in the direction of a path as shown in drawing 8 ] with the edge of press section 39a, respectively.

[0083] Moreover, the closing motion lever 39 and the closing motion lever 38 are inserted in two or more hole 4b prepared in the other end surface part of the shaft orientations of a rotating cylinder 4 by turns like the above-mentioned in the hoop direction. And the closing motion lever inserted in the closing motion lever inserted in hole 4b by the side of an end side, this hole 4b, and hole 4b by the side of the other end side which counters serves as relation in which the other side serves as the closing motion lever 39, if one side serves as the closing motion lever 38.

[0084] In the operation gestalt shown in an accompanying drawing, since crevice 4a of a rotating cylinder 4 shifts by turns and is formed in shaft orientations, as for the closing motion lever 39, die length is short rather than the closing motion lever 38. The edge of the closing motion levers 38 and 39 of both sides is in contact with the outside edge of both the transfer lever 36 of the subject unit 32 for depilation inserted in crevice 4a, respectively. And in the condition that the force of pushing the closing motion lever 39 from an outside does not act, the two central lower parts of movable pawl 5a are pushed outside according to the spring force of a spring 37, both the transfer lever 36 is pushed outside by this, and, thereby, the two outside lower parts of movable pawl 5a are pushed outside, respectively. Thus, it separates from fixed pawl 5b which two movable pawl 5a of the center of this rotated the hole edge of square hole 33c for movable pawl insertion of the supporting-point plate 33 as the supporting point by the two central lower parts of movable pawl 5a being pushed outside, and was prepared in the supporting-point stop member 35. Moreover, the lower part of movable pawl 5a of both outsides separates from fixed pawl 5b which two movable pawl 5a of both sides rotated the hole edge of square hole 33c for movable pawl insertion of the supporting-point plate 33 as the supporting point by an outside being pushed, and was prepared in the rotating cylinder 4.

[0085] Shaft 4b is inserted in the rotating cylinder 4, and the both ends of shaft 4b of the above-mentioned cylinder 4 are supported to revolve to boss section 28b which was prepared in the cylinder cover 28 which was projected towards the upper part from the top-face section of the end section of the cylinder anchoring pedestal 27, and which projects and is attached in the other end of supporter 27a and the cylinder anchoring pedestal 27 and which it projected and was prepared in supporter 28a, respectively.

[0086] As shown in drawing 8, the cam insertion holes 27c and 28c which carried out the shape of a square hole, respectively are formed in the protrusion supporters 27a and 28a, and the axial support slots 27d and 28d are formed in the vertical edge of the cam insertion holes 27c and 28c. And the roller which constitutes a cam 29 is inserted in the cam insertion holes 27c and 28c, respectively, the vertical both ends of roller shaft 29a inserted in each roller insert in the axial support slots 27d and 28d, and are supported, and a roller carries out level rotation. Some rollers are projected inside from the cam insertion holes 27c and 28c here.

[0087] The maintenance spring insertion slots 27e and 28e are established in the outside lower part of protrusion supporter 27a and protrusion supporter 28a, the lower part which made the shape of U character of the maintenance spring 30 the maintenance spring insertion slots 27e and 28e, respectively inserts in, and is supported, and stop protruding piece section 30a prepared in the U character-like part is stopped and attached in the stop pores 27f and 28f prepared in the maintenance spring insertion slots 27e and 28e. Pore 30b is formed in the upper part of the maintenance spring 30, the vertical both ends of roller shaft 29a are elastically pressed by the vertical edge of this pore 30b, and a roller contacts the maintenance spring 30 by preparing pore 30b corresponding to this pore 30b.

[0088] In the inferior-surface-of-tongue section of the cylinder anchoring pedestal 27, the hook

11 of a pair turned caudad and has projected so that the both sides of a direction parallel to shaft 4b of a rotating cylinder 4 may be countered, respectively, it inserts in the both-sides section of the direction which intersects perpendicularly with shaft 4b of the rotating cylinder 4 of the cylinder anchoring pedestal 27, and 27h of crevices is formed. Moreover, cavity 27i is prepared in the edge of the opposite side the direction which projected protrusion supporter 27a of the cylinder anchoring pedestal 27, the gearing 40 for a drive is stationed in this cavity 27i, the both ends of the shaft of this gearing 40 for a drive are supported to revolve to the cylinder anchoring pedestal 27 and cylinder cover 28, and the upper part of the gearing 40 for a drive has geared with the gearing 41 which prepared in the rotating cylinder 4. The cylinder anchoring pedestal 27 and cylinder cover 28 are combined where a rotating cylinder 4 is attached, and it fixes, and the depilation head 2 consists of putting and attaching the head frame 31 in this condition.

[0089] The depilation head 2 of the above-mentioned configuration is attached free [ attachment and detachment ] to the body casing 1. It attaches by inserting in the hook 11 of the pair of the inferior surface of tongue of the depilation head 2 in anchoring of the depilation head 2, in opening which carried out the shape of a rectangle of both the slide frame 26, respectively, where control unit 26a is pushed, moving both the slide frame 26 outside according to the spring 26d spring force by canceling press of control unit 26a in this condition, and stopping support hook 26b on the above-mentioned hook 11. In this case, it is attached certainly, without having inserted in 27h of insertion crevices of the cylinder anchoring pedestal 27 support protruding piece 15i of the pair which protruded on 15g of projected parts for a tunnel, and the depilation head 2 shaking to the body casing 1. Thus, where the depilation head 2 is attached to the body casing 1, it transmits to the gearing 41 which the gearing 40 for a drive and the gearing 20 for an output will mesh, therefore prepared rotation of a motor 3 in the rotating cylinder 4 through the gear train, and a rotating cylinder 4 is rotated.

[0090] Since support hook 26b can be removed from hook 11 by pushing control unit 26a on the above and reverse on the other hand in removing the depilation head 2, it can remove by pulling apart the depilation head 2 in this condition.

[0091] Although the hair of the body is depilated where it carried out the deer and the depilation head 2 is attached in the body casing 1, depilation is performed by [ as being the following ].

[0092] That is, a rotating cylinder 4 is rotated through a gear train by rotating a motor 3. If it comes to the location equivalent to the roller with which a rotating cylinder 4 rotates and the press sections 38a and 39a of the closing motion levers 38 and 39 constitute a cam 29 A spring 37 is resisted in the closing motion levers 38 and 39 with a roller. Inside Push, While pushing the lower part of outside movable pawl 5a inside by the point of the closing motion levers 38 and 39, the transfer lever 36 is pushed and moved inside through the lower part of movable pawl 5a of this outside, and the lower part of inside movable pawl 5a is pushed inside. Thus, movable pawl 5a rotates by the lower part of movable pawl 5a of four sheets being pushed inside, the upper part of movable pawl 5a will push and hit fixed pawl 5b, respectively, and the hair introduced between movable pawl 5a and fixed pawl 5b will be pinched. And hair is drawn out because a rotating cylinder 4 rotates where this hair is pinched. The following closing motion levers 38 and 39 are pressed very much by the roller by rotation of a rotating cylinder 4 in the place of a roller, and hair is pinched and drawn out like the above.

[0093] Since the both ends of press section 38a of the closing motion lever 38 alternately established in the hoop direction have lapped here in the edge and hoop direction of press section 39a of the closing motion lever 39 as shown in drawing 8 While pressing with the roller the back end section of the hand of cut of the press section of the closing motion lever which contributed to pinching hair, the front end section of the press section of the following closing motion lever will be pressed by coincidence with a roller. This sake, Even if it arranges two or more pawls 5 to the hoop direction of a rotating cylinder 4, a long distance which pinches and draws out hair can be taken.

[0094] Although removed hair as mentioned above, it is prevented that hair and sebum invade into a motor 3 side by the existence of the waterproofing member 6 established in the middle of the gear train which constitutes a drive means of communication.

[0095] Since neither hair nor sebum invades into a motor 3 side in cleaning of depilation equipment rather than the part which formed the waterproofing member 6 in the middle of the gear train as mentioned above, and formed the waterproofing member 6, it can clean up easily rather than the waterproofing member 6 by what is necessary being just to clean a rotating-cylinder 4 side. Moreover, if it washes in cold water while it can become possible [ cleaning up by washing in cold water ] since it is prevented by the waterproofing member 6 for water to go into a motor 3 side, it can wash out hair and sebum simply and certainly by washing in cold water and uses a brush in this case, the hair and sebum which coiled around the pawl 5 or the gearing more, or adhered can be cleaned easily.

[0096] The depilation head 2 equipped with the rotating cylinder 4 to the body casing 1 like the above-mentioned operation gestalt by and the thing to consider as the configuration attached free [ attachment and detachment ] As shown in drawing 10 in cleaning, by removing and cleaning the depilation head 2 from the body casing 1 It can clean up easily to all the corners, only the depilation head 2 especially separated from the motor 3 in washing in cold water can be washed in cold water preponderantly, and it becomes possible to wash finely in cold water a rotating cylinder 4, the hair which has coiled or adhered to the pawl 5 grade, and sebum.

[0097] Although the gearing 40 for a drive is exposed in the inferior-surface-of-tongue section of the depilation head 2 here as already stated Since the hook 11 prepared in the inferior surface of tongue of the depilation head 2 is made to have projected rather than the exposure location of the gearing 40 for a drive When the depilation head 2 is removed as mentioned above for cleaning etc., the gearing 40 for a drive will be located inside hook 11, and can prevent that the gearing 40 for a drive is damaged in other objects.

[0098] Moreover, although considered as the configuration in which the gearing 20 for an output was exposed in opening 15b of the upper pedestal 15 which covers upper opening of the body casing 1 and constitutes the top-face section of the body casing 1 Since the hook anchoring section prepared in the top-face section of the upper pedestal 15 is made to have projected rather than the exposure location of the gearing 20 for an output When the depilation head 2 is removed, the gearing 20 for an output will be located inside the hook anchoring section, and can prevent that the gearing 20 for an output is damaged in other objects.

[0099] By the way, although control unit 26a of the slide frame 26 which is one of the configuration members of the hook anchoring section is made to have projected from hole 7e of the body casing 1 as already stated By having formed in the location where hole 7e which makes control unit 26a project shifted to the upper limit opening approach of the body casing 1 rather than the sealing-water location by the 2nd waterproofing member 6 Even if hair, sebum, and water enter in the body casing 1 from hole 7e which makes control unit 26a project, it does not go into the part to which this hair, sebum, and water carried out the interior of the motor 3 of the body casing 1.

[0100] Moreover, although it \*\*\*\*s while inclusion of a motor 3 and the gear train divides a pedestal into two or more pedestals so that easily, and it stops two or more of these pedestals with a stop means, and it has fixed with the ingredient 21 Since each of stop locations by the stop means and fixing locations by the fixing implement 21 is located in the body casing 1 rather than the sealing-water location by the 2nd waterproofing member 23 It is not necessary to take into consideration invasion prevention of the hair and sebum from a stop or a fixing part, and water, and the structure of assembly fixing of the pedestal 8 divided by this becomes easy.

[0101] Next, based on drawing 12 and drawing 13 , it explains per other operation gestalten. With the operation gestalt shown in drawing 7 and drawing 8 , locate caudad the abbreviation lower half of lower semicircle-like insertion section 14b rather than the apical surface of wall 14a by projecting, project in the part in the lower half of [ abbreviation ] lower semicircle-like insertion section 14b, and the apical surface of wall 14a is exposed. While pressing against the top face of lower semicircle-like insertion section 14b which started and established the inferior surface of tongue of annular solid 6a of the waterproofing member 6 in section 14b, the inferior surface of tongue of upper semicircle-like insertion section 15e of 15d of suspension walls is pressed against the top face of annular solid 6a. Furthermore, although the operation gestalt which carries out press support of the annular solid 6a from the upper and lower sides and the side as

presses the side face of annular solid 6a for the part exposed to lower semicircle-like insertion section 14b which the apical surface of protrusion wall 14a carried out, and is performing station keeping and a sealing water is shown As shown in drawing 12 and drawing 13, project and all of lower semicircle-like insertion section 14b are located above wall 14a. While pressing against the top face of lower semicircle-like insertion section 14b which started and established the inferior surface of tongue of annular solid 6a of the waterproofing member 6 in section 14b Vertical press support of the annular solid 6a may be carried out by pressing the inferior surface of tongue of upper semicircle-like insertion section 15e of 15d of suspension walls against the top face of annular solid 6a, and station keeping and a sealing water may be performed.

[0102] Moreover, in the operation gestalt shown in above-mentioned drawing 12, the reduction gear 19 which is the 2nd reduction gear fixes two gearings with which paths differ through a clearance on both sides of shaft 19c (getting it blocked and fixing main wheel 19a and pinion 19b through a clearance, respectively), and is inserted in the part between main wheel 19a of shaft 19c of a reduction gear 19, and pinion 19b in watertight in annular solid 6a of the waterproofing member 6. As shown in drawing 12, it is not necessary to use the gearing of the complicated structure which formed main wheel 19a, pinion 19b, and boss 19d in one, and in this operation gestalt, main wheel 19a of an easy configuration and pinion 19b of an easy configuration can be used.

[0103] By the way, although each above-mentioned operation gestalt showed the example in which the pedestal formed in another object the waterproofing member 6 which has elasticity, as shown in drawing 11, the waterproofing member 6 may be united with a pedestal. In the operation gestalt shown in drawing 11, the waterproofing member 6 is formed in the upper limit section of the gearing covering pedestal 14 at one. Here, in unifying, what pasted up the waterproofing member 6 on the gearing covering pedestal 14 which is a pedestal 8 may be used, or you may really fabricate with 2 color shaping.

[0104] Next, based on drawing 14 and drawing 15, it explains based on the operation gestalt of further others of this invention. In this operation gestalt, it constitutes from a pedestal 12 for motor interiors to which a pedestal carries out the interior of the motor 3, a pedestal 13 for covers for covering a motor 3, and a gearing covering pedestal 14 for covering the gear train in the method of an outside of the pedestal 13 for covers, and the three above-mentioned pedestals 8 are \*\*\*\*\*ed and connection fixing has been carried out with the ingredient 21. It projects from the upper part of the opposite side to the upper part the anchoring side of the pedestal 13 for covers of the pedestal 12 for motor interiors, and 12d of supporters is projected, and it projects from the upper part of the gearing covering pedestal 14 to the upper part, supporter 14i is projected, and the both ends of shaft 4b of a rotating cylinder 4 are supported to revolve with both the protrusion supporters 12d and 14i formed in the pedestal. In this operation gestalt, a motor 3, the gear train, and a rotating cylinder 4 can be simply incorporated to a pedestal, and can carry out interior now.

[0105] 13d of vertical partition sections which prepared convex wall 13e for a partition in the pedestal 13 for covers, and were set up towards the upper part in the operation gestalt shown in this drawing 14 from this convex wall 13for partition e, Vertical partition section 14j which turned caudad and was installed from the gearing covering pedestal 14, A vertical partition is constituted by the waterproofing member 6 which intervened between the tips of both the length partition sections 13d and 14j, and the part in which the batch was surrounded by the other end of the upper part of the pedestal 12 for motor receipt and vertical partition in the dead air space which carried out the interior of the gear train by this vertical partition is used as opening 42. The shaft 43 has penetrated in watertight annular solid 6a prepared in the waterproofing member 6 located in the center section of the partition, and the both ends of this shaft 43 are supported to revolve to the gearing covering pedestal 14 and the pedestal 12 for motor interiors. Moreover, the single-sided half section of a shaft 43 is in the condition of having been constructed so that the inside of the above-mentioned opening 42 might be crossed. On the shaft 43, the gearing is fixed through the vertical partition at both sides, respectively. Here, the gearing located in a motor 3 side is the input lateral-tooth vehicle 44 by which the rotation from a motor is transmitted, and the gearing located in opening 42 is the gearing 20 for an output.

[0106] The gearing 20 for an output meshes with the gearing 41 which prepared in the rotating cylinder 4. Therefore, it is what serves as the last stage gearing of the gear trains for transmitting to the gearing 41 with which the output gearing 20 prepared rotation of a motor 3 in the rotating cylinder 4 in this operation gestalt. Since the sealing water has been carried out by the waterproofing member 6 in a part for this last stage gearing's shank It can clean up easily by what is necessary's being to clean only a rotating cylinder 4 and the last stage gearing of the gear trains in cleaning, and not cleaning other gearings of the gear train, and hair, sebum, etc. can be easily washed out by washing in cold water.

[0107] Although a rotating cylinder 4 cannot detach and attach freely to the body casing 1 in this operation gestalt, it is good also as attachment and detachment being free, and you may make it waterproof the depilation head 2 equipped with the rotating cylinder 4 like the above-mentioned operation gestalt by the waterproofing member 6 in the gear train's shaft or boss part of the last gearing also in this case to the body casing 1. In this case, there is no gearing in addition to gearing 41 prepared in the depilation head 2 side which can be detached and attached freely at the rotating cylinder 4, and it becomes easy to remove and clean the depilation head 2.

[0108] Moreover, you may one and really [ of a pedestal 8 ] which divided the waterproofing member 6 also with this operation gestalt form.

[0109] Next, based on drawing 16 thru/or drawing 18 , it explains per operation gestalt of further others of this invention. In this operation gestalt, the upper pedestal 15 is fixed in the upper part of the pedestal 12 for motor interiors which carried out the interior of the motor 3 which is a driving source, the pedestal 8 is constituted, and while carrying out the interior of the pedestal 8 which built in this motor 3 to the body casing 1, the 2nd waterproofing member 23 is infixed between the body casing 1 and the up periphery of the upper pedestal 15. The revolving shaft 45 which inserted in output-shaft 3a of a motor 3, and fixed is inserted in hole 15j prepared in the upper part of the upper pedestal 15, and the upper limit section of this revolving shaft 45 has projected to the upper part exterior through the hole prepared in the top-face section of 15g of projected parts for a tunnel prepared in the top-face section of the upper pedestal 15. The waterproofing member 6 is infixed between the inner skin section of hole 15j of the upper pedestal 15, and the periphery section of a revolving shaft 45. While being covered with the lid of the upper opening of the body casing 1 which carried out the interior of the built-in \*\*\*\* pedestal for the motor 3 by the upper pedestal 15 by this, it has the structure where neither hair nor sebum nor water goes into the interior by the waterproofing member 6 and the 2nd waterproofing member 23. Engagement section 45a is formed in the upper part of a revolving shaft 45.

[0110] The hook anchoring section 10 is formed in the upper part of the upper pedestal 15 like the already described operation gestalt. The depilation head 2 consists of the rotating cylinder 4 equipped with the depilation means, the cylinder anchoring pedestal 27, the bottom pedestal 46 of a head side, cylinder cover 28, a cam 29, a maintenance spring 30, and a head frame 31.

[0111] The cylinder anchoring pedestal 27 and cylinder cover 28 are arranged in the head frame 31, the bottom pedestal 46 of a head is further arranged over the inferior-surface-of-tongue section of the cylinder anchoring pedestal 27, and the inferior-surface-of-tongue section of cylinder cover 28, these members are \*\*\*\*ed, and connection fixing has been carried out with the ingredient 21. Since the structure of a depilation means, a rotating cylinder 4, and maintenance spring 30 grade is the same as the above-mentioned thing, explanation is omitted. The interior of the gear train has been carried out into the depilation head 2, and it has geared with the gearing 41 which the last gearing 47 of this gear train prepared in the rotating cylinder 4. The gearing 50 which has formed opening in the center section of the bottom pedestal 46 of a head side, has arranged the gearing 48 of the start edge of the above-mentioned gear train in this opening, and has gearing section 50a which gears with the gearing 48 of the start edge between the gearing 48 of the start edge and the gearing 47 of termination in the peripheral face section, and has face gearing section 50b in the top-face section, and a gearing's 50 face gearing section 50b and the gearing 47 of termination mesh. Engagement section 45a of the above-mentioned revolving shaft 45 and engaged portion 48a which can be engaged are prepared for the gearing 48 of the start edge at the inferior-surface-of-tongue section. Moreover, in the

inferior-surface-of-tongue section of the bottom pedestal 46 of a head side, hook 11 turns caudad and is projected.

[0112] A deer is carried out, in this operation gestalt, it is attaching hook 11 in the hook anchoring section 10 free [ attachment and detachment ] like the above-mentioned operation gestalt, the depilation head 2 is attached in the body casing 1, and it engages with engaged portion 48a of the gearing 48 of the start edge of the gear train prepared in engagement section 45a of a revolving shaft 45 in this case at the depilation head 2. Therefore, rotation of a motor 3 pinches hair with the pawl 5 which rotated the rotating cylinder 4 through the gear train which carried out interior to the revolving shaft 45 and the depilation head 2, and was formed in the rotating cylinder 4, and draws out. In this case, hair and sebum enter in the body casing 1 by the waterproofing member 6.

[0113] Washing in cold water will be possible, cleaning up by washing in cold water, cleaning up and attaching the depilation head 2 in the body casing 1 attaching the depilation head 2 in the body casing 1 in cleaning, and it being prevented that water permeates into the body casing 1 by the waterproofing member 6 in this case, and preventing that water infiltrates into a motor 3 side. Moreover, the depilation head 2 can be removed from the body casing 1 by canceling the stop of hook 11 and the hook anchoring section 10, the depilation head 2 and body casing 1 side can be cleaned in this condition, respectively, the inferior-surface-of-tongue side of the depilation head 2, it can be made to be able to expose, respectively and the top-face side of the body casing 1 can be cleaned. Of course, it can wash in cold water more finely by separating and washing the depilation head 2 and the body casing 1 in cold water.

[0114]

[Effect of the Invention] If it is in invention of this invention according to claim 1 as mentioned above The rotating cylinder which has body casing which has the grasping section which it can have by hand, and a depilation means to have two or more pawls which open and close and hold hair, and for rotation draw out hair, Since the waterproofing member for carrying out the sealing water of the driving source side to a rotating cylinder from a driving source to a rotating-cylinder side in the thing equipped with the driving source for rotating a rotating cylinder in the middle of a drive means of communication for carrying out drive transfer is prepared Hair and sebum can be prevented from going into a driving source side by the waterproofing member, consequently cleaning of hair or sebum can be performed simply, and since water does not infiltrate into a motor side even if it washes in cold water, it can wash in cold water. Even place [ which is hard to clean only with a brush ], washing in cold water can remove easily, and depilation equipment can be easily made into a clean condition.

[0115] Moreover, if it is in invention according to claim 2, it adds to the effect of the invention of the claim 1 above-mentioned publication. Since it is constituted by the gear train for transmitting the drive from a driving source to the gearing which a drive means of communication prepared in the rotating cylinder and the waterproofing member is prepared in the gear train Since a drive is transmitted by the gear train compared with what transmits a drive with the conventional belt, it can waterproof with the easy configuration of preparing a waterproofing member in the gear train part which transmits a drive to the gearing which prepared in the rotating cylinder, and waterproofing into it, and structure is simplified.

[0116] Moreover, if it is in invention according to claim 3, since the waterproofing member is carrying out the sealing water in the reduction gear part which consists of a main wheel and a pinion in addition to the effect of the invention of the claim 2 above-mentioned publication, it can waterproof in the middle of the gear train with an easy configuration according to being able to attain miniaturization and making a waterproofing member intervene between the main wheel of a reduction gear, and a pinion with constituting a reduction gear from a main wheel and a pinion.

[0117] If it is in invention according to claim 4, to the effect of the invention of the claim 2 above-mentioned publication Moreover, in addition, the 1st waterproofing section in which a waterproofing member carries out a sealing water in a reduction gear part, Since the 2nd waterproofing section which carries out the sealing water of the separation joint between the pedestals which support a gearing's shaft to revolve was unified In carrying out the sealing water

of the driving source side to a rotating-cylinder side in the middle of the gear train The sealing water also of the separation joint part between the pedestals which support not only a reduction gear part but a gearing's shaft to revolve by the single waterproofing member can be carried out, and components mark decrease, and it can consider as cheap waterproofing structure, and the assembly of a member also becomes easy.

[0118] Moreover, if it is in invention according to claim 5, in addition to the effect of the invention of the claim 4 above-mentioned publication, while supports a gearing's shaft to revolve, and since it has formed in a pedestal and one, the 1st and 2nd waterproofing section can also perform an assembly easily while it can reduce member mark and becomes cheap.

[0119] Moreover, since it has arranged so that a gearing may be fixed to the both sides of the shaft supported to revolve to the pedestal in addition to the effect of the invention of the claim 2 above-mentioned publication and the sealing water of the waterproofing member may be carried out among both the gearings of this shaft if it is in invention according to claim 6 With the easy configuration of carrying out a sealing water by the waterproofing member in a part for the shank between the gearings which fixed to the both sides of the shaft of a reduction gear Invasion of the hair which can carry out the sealing water of the driving source side to a rotating-cylinder side, and is involved in by rotation of a gearing can be prevented certainly, and depilation equipment can be cleaned up more.

[0120] Moreover, if it is in invention according to claim 7, since the gearing fixed to the both sides of a shaft consists of a main wheel and a pinion in addition to the effect of the invention of the claim 6 above-mentioned publication The main wheel and pinion which were fixed to the both sides of a shaft will constitute a reduction gear, make the height of an instrument low, can attain miniaturization, and constitute a reduction gear from an easy configuration, and a waterproofing member is made to intervene between a main wheel and a pinion, and waterproofing is possible.

[0121] Moreover, if it is in invention according to claim 8, since a sealing water can be carried out by the waterproofing member in the gear train part built in body casing in addition to the effect of the invention of the claim 2 above-mentioned publication and a rotating cylinder can detach and attach freely to body casing A rotating cylinder is removed from body casing. Clean up including the inferior-surface-of-tongue section of a rotating cylinder, or Moreover, it becomes possible to clean a part of gear train of body casing, and it also becomes possible to remove a rotating cylinder and to wash only a rotating-cylinder side in cold water preponderantly.

[0122] Moreover, if it was in invention according to claim 9, since the sealing water was carried out to the rotating cylinder by the waterproofing member in a part for the shank of the last stage gearing which does drive transfer in addition to the effect of the invention of the claim 2 above-mentioned publication Hair and sebum can be easily dropped on washing in cold water that what is necessary is to prevent trespassing upon the interior of a part hair and sebum have arranged the gear train, consequently just to mainly clean a rotating-cylinder side in cleaning.

[0123] Moreover, if it is in invention according to claim 10, it adds to the effect of the invention of the claim 1 above-mentioned publication. The revolving shaft which rotates by the driving source from body casing which built in the driving source A projection, Since the depilation head equipped with the rotating cylinder which rotation of a revolving shaft is transmitted and is rotated is attached free [ attachment and detachment ] to body casing and the waterproofing member is carrying out the sealing water in the revolving-shaft part The sealing water of the driving source side can be carried out to a rotating-cylinder side with the easy configuration of attaching and carrying out the sealing water of the waterproofing member to the revolving shaft by the side of a driving source. The structure of a waterproofing member can be simplified compared with the case where the sealing water of the waterproofing means is attached and carried out to a gear train part. Moreover, that what is necessary is to remove a depilation head in cleaning and just to mainly clean a depilation head side Moreover, beautiful cleaning can be performed by removing a depilation head in washing in cold water, and mainly washing a depilation head side in cold water, and since it has waterproofed by the waterproofing member even if it washes a body casing side in cold water, it is satisfactory, and a body casing side can also be cleaned finely.



[0124] Moreover, if it was in invention according to claim 11, since the gear train was prepared in the depilation head separated from body casing in addition to the effect of the invention of the claim 10 above-mentioned publication, the hair involved in a gear train can be washed out easily.

[0125] Moreover, in addition to invention of the claim 1 above-mentioned publication, since a driving source is a motor, a driving source is easily [ in body casing ] incorporable, if it is in invention according to claim 12.

[0126] Moreover, if it is in invention according to claim 13, it adds to the effect of the invention of the claim 2 above-mentioned publication. Since the 2nd waterproofing member is infixed between body casing and the up periphery of a pedestal while carrying out the interior of the pedestal which built in the motor and the gear train which are a driving source to body casing It can prevent that hair and sebum invade from between body casing and pedestals by the 2nd waterproofing member. Moreover, it is what can prevent that water infiltrates into the interior from between body casing and pedestals also when it washes in cold water. Consequently, it is good and the inclusion parts of the motor to a pedestal are the structure where only the upper part can carry out water seal of the pedestal which built in a motor and the gear train through body casing and the 2nd waterproofing member, then the thing which does not need to take waterproofing into consideration and can simplify structures, such as inclusion of the motor to a pedestal.

[0127] Moreover, if it is in invention according to claim 14, it adds to the effect of the invention of the claim 13 above-mentioned publication. Since opening to which one of the gearings which constitute the gear train is located in the upper part of a pedestal is prepared and a waterproofing member is arranged in the middle of the drive transfer path between the motor within a pedestal, and the gearing located in the above-mentioned opening It can consider as the structure where neither hair nor sebum nor water goes into a motor side by the waterproofing member between a motor and opening of a pedestal.

[0128] Moreover, if it is in invention according to claim 15, since the gear train interior section which carries out the interior of the gear train to the motor interior section which carries out the interior of the motor to a pedestal is prepared in addition to the effect of the invention of the claim 14 above-mentioned publication and the motor interior section and the gear train interior section are divided by partition, hair, sebum, water, etc. can be prevented from going into a motor side from a gear train side with an easy configuration by partition.

[0129] Moreover, if it is in invention according to claim 16, since the pedestal which built in the motor and the gear train which are a driving source combines the pedestal into which plurality was divided in addition to above-mentioned claim 4 or an effect of the invention according to claim 14 or 15, in including a motor, the gear train, and a waterproofing member in a pedestal, there is an advantage that it is easily incorporable since it is the divided pedestal.

[0130] If it is in invention according to claim 17, to the effect of the invention of the claim 16 above-mentioned publication Moreover, in addition, the pedestal for motor interiors to which a pedestal carries out the interior of the motor, The pedestal for covers for covering a motor, and the gearing covering pedestal for covering the gear train in the method of an outside of the pedestal for covers, Since it consists of wrap top pedestals and connection fixing of two or more above-mentioned pedestals has been carried out, the upper part of the pedestal for motor interiors, the pedestal for covers, and a gearing covering pedestal What is necessary is just to carry out in the periphery section of one member called an upper pedestal in carrying out the sealing water of the waterproofing of body casing and a pedestal by the 2nd waterproofing member by being able to perform simply the inclusion to the pedestal of a motor and the gear train, and establishing an upper pedestal. The structure of a sealing water with body casing can be simplified.

[0131] Moreover, if it is in invention according to claim 18, since the pedestal for covers constitutes the partition which divides the motor interior section and the gear train interior section in addition to the effect of the invention of the claim 17 above-mentioned publication, the partition with which the pedestal for covers which is one of the pedestals divided into three members divides the motor interior section and the gear train interior section will be made to serve a double purpose, member mark decrease, and structure is simplified.



[0132] Moreover, if it is in invention according to claim 19, it adds to the effect of the invention of the claim 18 above-mentioned publication. Since the gear train is made into the gear train interior section by which interior is carried out, the dead air space which fixed the both ends of a gearing covering pedestal in the condition of having contacted, to the pedestal for covers which is a partition, and was surrounded by the pedestal for covers, and the gearing covering pedestal. The sealing water of the perimeter of the gear train interior section divided with a waterproofing member part will be surrounded and carried out by the pedestal for covers, and the gearing covering pedestal, and it can simplify sealing-water structure.

[0133] Moreover, if it is in invention according to claim 20, it adds to the effect of the invention of the claim 19 above-mentioned publication. Since opening of the upper part of the gear train interior section which consists of dead air space surrounded by the pedestal for covers and the gearing covering pedestal is carried out and this opening and opening prepared in the upper pedestal are made to have opened for free passage. A part of gear train which carried out interior to the gear train interior section can be located in opening of an upper pedestal, and it can consider as the structure of transmitting power to a rotating-cylinder side with an easy configuration.

[0134] If it is in invention according to claim 21, to above-mentioned claim 4 or an effect of the invention according to claim 16. Moreover, in addition, the 1st waterproofing section in which a waterproofing member carries out a sealing water in a reduction gear part, The 2nd waterproofing section which carries out the sealing water of the separation joint between the pedestals which support a gearing's shaft to revolve is unified. Since it consists of an annular solid for inserting in the shaft of the boss whom the 1st waterproofing section prepared for the gearing, or a gearing and consists of a band-like frame for the 2nd waterproofing section to carry out a sealing water along with the separation joint between pedestals succeeding band-like. By inserting an annular solid in the shaft of the boss who prepared the gearing, or a gearing, a sealing water can be carried out in the middle of the gear train. Moreover, the sealing water of the separation joint part between the pedestals divided through the band-like frame can be carried out, the sealing water in the middle of being this gear train and the sealing water of the separation joint part between pedestals can carry out continuously by one waterproofing member, and sealing-water structure is simplified, and an assembly can be performed easily.

[0135] Moreover, if it is in invention according to claim 22, it adds to the effect of the invention of the claim 21 above-mentioned publication. A suspension wall is projected from an upper pedestal from a projection and a gearing covering pedestal to gear train interior circles to gear train interior circles. A wall A projection, Project with the point of a suspension wall, make a waterproofing member intervene between the points of a wall, project with a suspension wall, and the gear train interior section is divided with a wall and the waterproofing member made to intervene between them into the side in which the output shaft of a motor is located the opening side prepared in the upper pedestal side. Since a gearing's boss or a gearing's shaft has penetrated the inside of the hole of the annular solid of a waterproofing member in watertight, gear train interior circles can be divided with an easy configuration into an opening and motor side according to sealing-water structure through a waterproofing member at a part for the shank of a gearing's boss or a gearing.

[0136] Moreover, if it is in invention according to claim 23, since in addition to the effect of the invention of the claim 21 above-mentioned publication the lower limit surface part of a suspension wall is contacted by pressing in the upper limit side of a waterproofing member and the point of a protrusion wall is contacted by pressing on the side face of a waterproofing member. It projects with a suspension wall through a waterproofing member, between walls is sealed, gear train interior circles can be easily divided with a part for the shank of a gearing's boss or a gearing into an opening and motor side according to sealing-water structure through a waterproofing member, and sealing-water structure becomes easy.

[0137] Moreover, if it is in invention according to claim 24, it adds to the effect of the invention of the claim 22 above-mentioned publication. Form the upper semicircle-like insertion section in the lower limit section of a suspension wall, and the lower semicircle-like insertion section is formed in the point of a protrusion wall. While inserting in the upper semicircle-like insertion

section the upper part of an annular solid established in the waterproofing member, since it has inserted in the lower semicircle-like insertion section, the lower part of an annular solid While positioning of the annular solid prepared in the waterproofing member is made certainly, it can do with structure with the easy sealing water of an annular solid, and a suspension wall and a protrusion wall, and positioning of an annular solid can be performed simply and certainly, positioning of a waterproofing member can be performed certainly, and the sealing water by the waterproofing member will be made certainly.

[0138] Moreover, if it is in invention according to claim 25, it adds to above-mentioned claim 21 or an effect of the invention according to claim 23. Since the lower limit surface part of a suspension wall is contacted by pressing in the upper limit side of a waterproofing member, it started and starts to the point of a protrusion wall towards the upper part, the section is prepared and this standup section is contacted by pressing in the lower limit side of a waterproofing member While a waterproofing member starts with a suspension wall, is pinched from the upper and lower sides in the section and a positive sealing water is made, anchoring of a waterproofing member can be ensured.

[0139] Moreover, if it is in invention according to claim 26, it adds to an effect of the invention given in either above-mentioned claim 21 thru/or claim 25. Form the bottom zonite-like sections successively at one in the direction which approaches mutually from the lower limit of the vertical band-like section while turning caudad from the both ends of the U-shaped belt part which carried out the sideways U shape and hanging the vertical band-like section to one, and a band-like frame is constituted. While forming annular solids successively at one between the tips of the bottom zonite-like section which a band-like frame counters, inserting in a suspension wall between the both length band-like sections and contacting a suspension wall by pressing on the inside of the both length band-like section, the both Shimo zonite-like section, and the top face of an annular solid, it contacts by pressing in the upper limit side of a U-shaped belt part around opening of the inferior surface of tongue of an upper pedestal. Since the upper limit section of a gearing covering pedestal is contacted by pressing on the inferior surface of tongue of a U-shaped belt part and the vertical band-like section is pinched by the gearing covering pedestal and the pedestal for covers while contacting the point of a protrusion wall by pressing in the bottom zonite-like section and the lower limit section of an annular solid You make it located along with the joint part of the pedestal which divided the waterproofing member into the plurality of an upper pedestal, a gearing covering pedestal, and the pedestal for covers, and the pedestal of three \*\* can perform the sealing water of the joint part of each pedestals with an easy configuration certainly in support of a waterproofing member.

[0140] Moreover, if it is in invention according to claim 27, it adds to the effect of the invention of the claim 21 above-mentioned publication. The convex wall for a partition is projected from the pedestal for covers from a projection and a gearing covering pedestal to gear train interior circles. A wall A projection, Project with the point of the convex wall for a partition, and a waterproofing member is made to intervene between the points of a wall. Project with the convex wall for a partition and the gear train interior section is divided with a wall and the waterproofing member made to intervene between them into the side in which the output shaft of a motor is located the opening side prepared in the upper pedestal side. Since a gearing's boss or a gearing's shaft has penetrated the inside of the hole of the annular solid of a waterproofing member in watertight, gear train interior circles can be divided with an easy configuration into an opening and motor side according to sealing-water structure through a waterproofing member at a part for the shank of a gearing's boss or a gearing.

[0141] Moreover, if it is in invention according to claim 28, it adds to the effect of the invention of the claim 27 above-mentioned publication. Since turn the point of the convex wall for a partition up, make it project, and it considers as the vertical partition section, and turn the point of a protrusion wall caudad, hangs, it considers as the vertical partition section and the annular solid of a waterproofing member is made to intervene between both the length partition sections The annular solid of a waterproofing member can be pinched from the upper and lower sides in the vertical partition section and the vertical partition section, and a sealing water can be carried out with easy structure.

[0142] Moreover, if it is in invention according to claim 29, it adds to above-mentioned claim 3 or an effect of the invention according to claim 21 to 28. The output shaft of the motor which carried out interior to motor interior circles is made to rush into gear train interior circles. Fix a pinion to an output shaft and the main wheel of the 1st reduction gear which has a main wheel and a pinion is engaged. Since the main wheel of the 2nd reduction gear which has a main wheel and a pinion in the pinion of the 1st reduction gear was engaged and the annular solid of a waterproofing member is inserted in the boss of the part between the main wheel of the 2nd reduction gear, and a pinion In the reduction gear part of the direction near a rotating cylinder, the sealing water of the waterproofing member can be attached and carried out among two or more reduction gears, consequently hair, sebum, and water can be prevented from going into the reduction gear side of the side near a motor, and it much more becomes easy to carry out cleaning.

[0143] Moreover, if it is in invention according to claim 30, it adds to above-mentioned claim 6, claim 7, or an effect of the invention according to claim 21 to 28. The output shaft of the motor which carried out interior to motor interior circles is made to rush into gear train interior circles. Fix a pinion to an output shaft and the main wheel of the 1st reduction gear which has a main wheel and a pinion is engaged. Since fixed the main wheel and the pinion on both sides of a shaft, the 2nd reduction gear was constituted, the main wheel of the 2nd reduction gear was engaged to the pinion of the 1st reduction gear and the annular solid of a waterproofing member was inserted in the part between the main wheel of the shaft of the 2nd reduction gear, and a pinion In the reduction gear part of the direction near a rotating cylinder, the sealing water of the waterproofing member can be attached and carried out among two or more reduction gears. Hair, sebum, and water can be prevented from going into the reduction gear side of the side near a motor, consequently the reduction gear side of the side near a motor does not need to clean up, and cleaning becomes easy to carry out it.

[0144] Moreover, if it is in invention according to claim 31, since the gearing for an output which meshes with the pinion of the 2nd reduction gear to the opening circles of an upper pedestal is stationed in addition to above-mentioned claim 29 or the effect of the invention according to claim 30 It is what can perform the output from the gear train prepared in the pedestal side with an easy configuration in opening of the upper pedestal which carried out the sealing water of the periphery section by the 2nd waterproofing member to body casing. Moreover, what is necessary is to clean near opening, and cleaning becomes easy at a body casing side.

[0145] Moreover, if it is in invention according to claim 32, since the both ends of the shaft of the 1st reduction gear and the shaft of the 2nd reduction gear are supported to revolve free [ rotation ] to the pedestal for covers, and the gearing covering pedestal, respectively in addition to above-mentioned claim 29 or the effect of the invention according to claim 30, inclusion of the 1st reduction gear to a pedestal and the 2nd reduction gear can be performed easily, and assembly nature improves.

[0146] Moreover, if it is in invention according to claim 33, since the both ends of the shaft of the gearing for an output are supported in both the walls section of opening of an upper pedestal in addition to the effect of the invention of the claim 31 above-mentioned publication The upper pedestal which attached the gearing for an output in opening can be attached in the upper part of the pedestal for covers and gearing covering pedestal incorporating the 2nd reduction gear, the 2nd reduction gear and gearing for an output can be engaged easily, and the gear train can be assembled.

[0147] Moreover, if it is in invention according to claim 34, it adds to above-mentioned claim 8 or an effect of the invention according to claim 31. The depilation head which prepared the rotating cylinder is attached free [ attachment and detachment ] to body casing. Since the gearing for a drive for driving a rotating cylinder on a depilation head is prepared, and the gearing for a drive is meshed free [ attachment and detachment ] on the gearing for an output where body casing is attached in a rotating cylinder In detaching and attaching the depilation head which prepared the rotating cylinder to body casing Can transmit rotation of a motor to a rotating cylinder with an easy configuration, can rotate a rotating cylinder, and, moreover, in cleaning By removing a depilation head, cleaning is possible to all the corners, and also in case it washes in cold water, it

also becomes possible to remove a depilation head and to wash only a depilation head side in cold water, and cleaning can perform it easily and finely.

[0148] Moreover, if it is in invention according to claim 35, it adds to the effect of the invention of the claim 34 above-mentioned publication. Since the gearing for a drive is exposed in the inferior-surface-of-tongue section of a depilation head, the hook for attaching in the inferior surface of tongue of this depilation head free [ the attachment and detachment to body casing ] is prepared and this hook is made to have projected rather than the exposure location of the gearing for a drive. When a depilation head is removed, the gearing for a drive will be located inside a hook, and it can prevent that the gearing for a drive is damaged in other objects, and can consider as structure which trouble does not produce in transfer of the rotation from a motor.

[0149] Moreover, if it is in invention according to claim 36, it adds to the effect of the invention of the claim 34 above-mentioned publication. The hook anchoring section for attaching the hook of the inferior-surface-of-tongue section of a depilation head in the top-face section of the upper pedestal which constitutes the top-face section of body casing free [ attachment and detachment ] is prepared. Since the hook anchoring section is made to have projected rather than the exposure location of the gearing for an output stationed to opening of an upper pedestal. When a depilation head is removed, the gearing for an output will be located inside the hook anchoring section, and it can prevent that the gearing for an output is damaged in other objects, and can consider as structure which trouble does not produce in transfer of the rotation from a motor.

[0150] Moreover, if it is in invention according to claim 37, it adds to the effect of the invention of the claim 36 above-mentioned publication. Since the method of outside [ hole / which prepared the control unit for canceling a stop with a hook in the hook anchoring section, and prepared this control unit in body casing ] is made to have projected. A stop with the hook anchoring section and a hook can be easily canceled of the hole of body casing by operating the control unit projected to the method of outside, and the attachment and detachment to body casing of a depilation head can be performed easily.

[0151] Moreover, if it is in invention according to claim 38, it adds to the effect of the invention of the claim 37 above-mentioned publication. While the upper part carries out the interior of the pedestal to body casing which carried out opening, the 2nd waterproofing member is infixed between body casing and the up periphery of a pedestal. Since the hole which makes a control unit project is formed in the location which shifted to the upper limit opening twist of body casing rather than the sealing-water location by the 2nd waterproofing member. Even if hair, sebum, and water enter in body casing from the hole which makes a control unit project, it can clean up easily by not going into the part to which this hair, sebum, and water carried out the interior of the motor of body casing.

[0152] Moreover, if it is in invention according to claim 39, it adds to the effect of the invention of the claim 17 above-mentioned publication. The end section of the upper part of the pedestal for motor interiors and the end section of an upper pedestal are stopped by the stop means. And since it fixes with a screw-thread implement with common other end of the lower part of the interior pedestal for motors, lower limit section of the pedestal for covers, and lower limit section of a gearing covering pedestal, and the upper part of a gearing covering pedestal \*\*\*\*s to the other end of an upper pedestal and is fixed more in detail. The pedestal for carrying out assembly fixing of the pedestal for motor interiors and the pedestal for covers which were trichotomized, and the gearing covering pedestal simply, and carrying out interior into body housing can be constituted.

[0153] Moreover, if it is in invention according to claim 40, it adds to the effect of the invention of the claim 39 above-mentioned publication. Since each of stop locations by the stop means and fixing locations by the up-and-down screw-thread implement makes it located in body casing rather than the sealing-water location by the 2nd waterproofing member. Since fusion of the half-segmented casing to which body casing divided two into perpendicularly and was carried out is carried out, it constitutes and the 3rd waterproofing member is made to be placed between the doubling parts of both half-segmented casing. The structure of assembly fixing of

the pedestal which did not need to take into consideration invasion of the hair or sebum from a stop or a fixing part of a pedestal, or water which were divided, and was divided becomes easy, and structure is simplified.

[0154] Moreover, if it is in invention according to claim 41, it adds to the effect of the invention of the claim 13 above-mentioned publication. Since fusion of the half-segmented casing to which body casing divided two into perpendicularly and was carried out is carried out, it constitutes and the 3rd waterproofing member is made to be placed between the doubling parts of both half-segmented casing In spite of being the configuration which can incorporate the pedestal inside body casing etc. easily, and broke two, and was carried out By intervening the 3rd waterproofing member, it can prevent half-segmented casing certainly that hair, sebum, and water trespass upon the interior of body casing from a \*\*\*\*\* part.

[0155] Moreover, if it is in invention according to claim 42, it adds to the effect of the invention of the claim 13 above-mentioned publication. Counter the upper part of the inside section of body casing, and the peripheral face section of an upper pedestal, respectively, form the 2nd waterproofing member insertion slot, and since the 2nd outside half section and inside half section of a waterproofing member are inserted in the 2nd waterproofing member insertion slot which counters In carrying out water seal of the inside section of body casing, and the peripheral face section of an upper pedestal by the 2nd waterproofing member, where the 2nd waterproofing member is positioned to body casing and an upper pedestal, it can attach. By this To body casing, positioning support can be carried out through the 2nd waterproofing member, vibration of the motor built in the pedestal decreases a pedestal by the 2nd waterproofing member, and it is made to propagation in a pile configuration at a body casing side, and waterproofing can be ensured.

[0156] Moreover, if it is in invention according to claim 43, it adds to the effect of the invention of the claim 41 above-mentioned publication. Since the before [ the 3rd waterproofing member ] side half section and the backside half section are inserted in the 3rd waterproofing member slot insertion slot of half-segmented casing which forms the 3rd waterproofing member insertion slot in the doubling part of half-segmented casing, and counters it forward and backward The 3rd waterproofing member can be positioned to the position of half-segmented casing, alignment of the half-segmented casing can be carried out by exact physical relationship through the 3rd waterproofing member positioned in this way, and waterproofing can be ensured.

[0157] Moreover, if it is in invention according to claim 44, it adds to the effect of the invention of the claim 41 above-mentioned publication. Counter the upper part of the inside section of body casing, and the peripheral face section of an upper pedestal, respectively, and the 2nd waterproofing member insertion slot is formed. The 2nd outside half section and inside half section of a waterproofing member are inserted in the 2nd waterproofing member insertion slot which counters. The 3rd waterproofing member insertion slot is formed in the doubling part of half-segmented casing. The before [ the 3rd waterproofing member ] side half section and the backside half section are inserted in the 3rd waterproofing member slot insertion slot of half-segmented casing which counters forward and backward. The 2nd waterproofing member insertion slot is made to open the edge of the 3rd waterproofing member insertion slot for free passage. Since it has contacted by pressing in the inferior-surface-of-tongue section of the 2nd waterproofing member which inserted in the 2nd waterproofing member insertion slot the edge of the 3rd waterproofing member inserted in the 3rd waterproofing member insertion slot The sealing water of the doubling part of half-segmented casing and the part between the inner circumference section of body casing and the peripheral face section of an upper pedestal can be continuously carried out with an easy configuration by the 3rd waterproofing member and the 2nd waterproofing member.

[0158] If it is in invention according to claim 45, to the effect of the invention of the claim 16 above-mentioned publication Moreover, in addition, the pedestal for motor interiors to which a pedestal carries out the interior of the motor, It consists of a pedestal for covers for covering a motor, and a gearing covering pedestal for covering the gear train in the method of an outside of the pedestal for covers. The protrusion supporter which connection fixing of two or more above-mentioned pedestals was carried out, and was projected from the upper part of the opposite side

to the upper part the anchoring side of the pedestal for covers of the pedestal for motor interiors, Since the rotating cylinder is supported with the protrusion supporter projected from the upper part of a gearing covering pedestal to the upper part, enabling free rotation The interior of a motor and the gear train can be carried out, the pedestal supported for a rotating cylinder, enabling free rotation can be constituted from an easy configuration, and inclusion of a motor, the gear train, and a rotating cylinder can be easily performed by dividing a pedestal into plurality.

[0159] If it is in invention according to claim 46, to above-mentioned claim 28 or an effect of the invention according to claim 45 Moreover, in addition, the vertical partition section set up towards the upper part from the pedestal for covers, The dead air space which carried out the interior of the gear train is divided with the vertical partition section which turned caudad and was installed from the gearing covering pedestal, and the vertical partition section constituted by the waterproofing member which intervened between the tips of both the length partition section. The part surrounded by the upside other end and the upside vertical partition section of the pedestal for motor receipt is used as opening. Make a shaft penetrate in watertight the inside of the hole of the annular solid prepared in the waterproofing member, and a gearing is fixed through the vertical partition section at both sides, respectively on this shaft. Since it considers as the input lateral-tooth vehicle by which one gearing is located in a motor side, and the rotation from a motor is transmitted, and the gearing of another side is located in opening circles and it has considered as the gearing for an output It is the thing hair, sebum, and water can be prevented from entering inside a vertical partition by dividing the middle of the gear train with the vertical partition section in watertight. Moreover, since the other side is located in opening circles and serves as a gearing for an output among the gearings located in both sides through the vertical partition section What is necessary is to clean only the gearing for an output which neither hair nor sebum nor water goes into the gear train by the side of a motor rather than the gearing for an output located in an opening part, and is located in opening, and cleaning can carry out more easily.

[0160] Moreover, if it is in invention according to claim 47, since it has geared with the gearing which prepared the gearing for an output in the rotating cylinder in addition to above-mentioned claim 9 or an effect of the invention according to claim 46, there is no gearing in addition to the gearing which prepared in the depilation head side at the rotating cylinder, and cleaning by the side of a depilation head can be performed easily.

[0161] Moreover, if it is in invention according to claim 48, since the waterproofing member which consists of the 1st and 2nd waterproofing section is formed in a gearing covering pedestal at one in addition to above-mentioned claim 5 or an effect of the invention according to claim 17 or 45 Inclusion of a waterproofing member is made to coincidence by being able to reduce member mark by unifying a waterproofing member and a gearing covering pedestal, and incorporating a gearing covering pedestal, and an assembly can be performed easily.

[0162] Moreover, if it is in invention according to claim 49, it adds to above-mentioned claim 10 or an effect of the invention according to claim 11. While carrying out the interior of the pedestal which built in the motor which is a driving source to body casing, the 2nd waterproofing member is infixed between body casing and the up periphery of a pedestal. Since the waterproofing member is infixed between the inner skin sections of a hole and the periphery sections of a revolving shaft which inserted the revolving shaft which rotates by the motor in the hole prepared in the upper part of a pedestal, and it was made to project outside, and were prepared in the upper part of this pedestal Waterproofing between body casing and the up periphery of a pedestal can be performed by the 2nd waterproofing member. Moreover, since waterproofing of the revolving shaft which projects from the hole of a pedestal by the waterproofing member can be performed, the sealing water of the motor which this built in the pedestal can be certainly carried out to a rotating-cylinder side and the 2nd waterproofing member is prepared It is not necessary to take water seal etc. into consideration, and the structure of inclusion of the motor to a pedestal can be simplified in built-in of the motor to a pedestal.

[0163] Moreover, if it is in invention according to claim 50, it adds to above-mentioned claim 11 or an effect of the invention according to claim 49. Since the engaged portion which inserts in

while forming the insertion hole for inserting a revolving shaft in the gearing of the start edge of the gear train which prepared the engagement section in the upper limit section of a revolving shaft, and was prepared in the depilation head free [ extraction and insertion ], and engages with the engagement section free [ attachment and detachment ] in a hole is prepared Where it could detach and attach the depilation head easily and a depilation head is attached, the engagement section can engage with an engaged portion and can transmit to the gearing of the start edge of the gear train which prepared rotation of a revolving shaft in the depilation head certainly with the easy configuration.

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[Translation done.]

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- 3.In the drawings, any words are not translated.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the transverse-plane sectional view of 1 operation gestalt of the depilation equipment of this invention.

[Drawing 2] It is a top view same as the above.

[Drawing 3] It is the side-face sectional view made into the cross section in the motor part same as the above.

[Drawing 4] It is the side-face sectional view made into the cross section in the waterproofing member part same as the above.

[Drawing 5] It is the decomposition perspective view of a body casing part same as the above.

[Drawing 6] It is the perspective view showing the condition of having intervened and attached the waterproofing member same as the above in the joint part of a gearing covering pedestal, the pedestal for covers, and an upper pedestal.

[Drawing 7] It is the decomposition perspective view showing a waterproofing member and a gearing covering pedestal same as the above.

[Drawing 8] It is the decomposition perspective view of a depilation head same as the above.

[Drawing 9] It is the decomposition perspective view of a rotating-cylinder part same as the above.

[Drawing 10] It is a transverse-plane sectional view in the condition of having removed the depilation head from body casing same as the above.

[Drawing 11] It is the perspective view which united the waterproofing member same as the above with the gearing covering pedestal.

[Drawing 12] It is the transverse-plane sectional view of other operation gestalten of this invention.

[Drawing 13] It is the decomposition perspective view showing a gearing covering pedestal for a waterproofing member same as the above.

[Drawing 14] It is the transverse-plane sectional view showing the operation gestalt of further others of this invention.

[Drawing 15] It is a top view same as the above.

[Drawing 16] It is the transverse-plane sectional view showing the operation gestalt of further

others of this invention.

[Drawing 17] It is a transverse-plane sectional view in the condition of having removed the depilation head from body casing same as the above.

[Drawing 18] It is the decomposition perspective view showing the engagement section prepared in the revolving shaft same as the above, and the engaged portion prepared for the gearing.

[Drawing 19] It is the transverse-plane sectional view of the conventional example.

[Drawing 20] It is the side-face sectional view of the conventional example.

[Description of Notations]

- 1 Body Casing
- 2 Depilation Head
- 3 Motor
- 4 Rotating Cylinder
- 5 Pawl
- 6 Waterproofing Member
- 8 Pedestal

[Translation done.]

\* NOTICES \*

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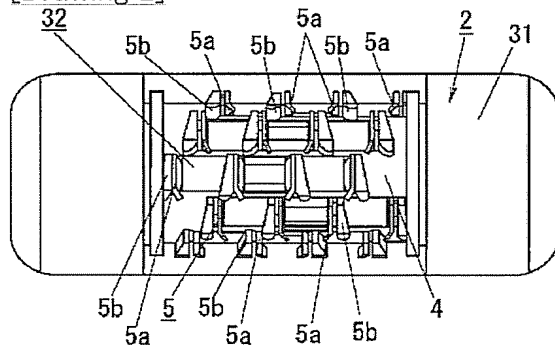
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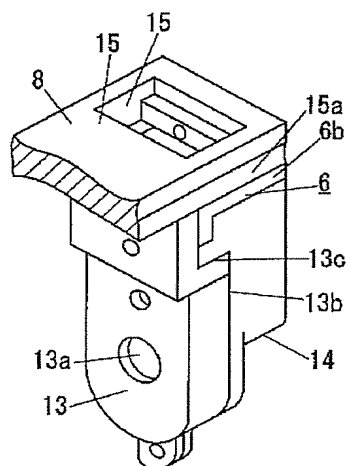
## DRAWINGS

[Drawing 2]

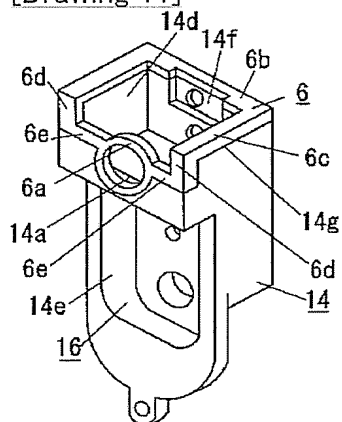


[Drawing 6]

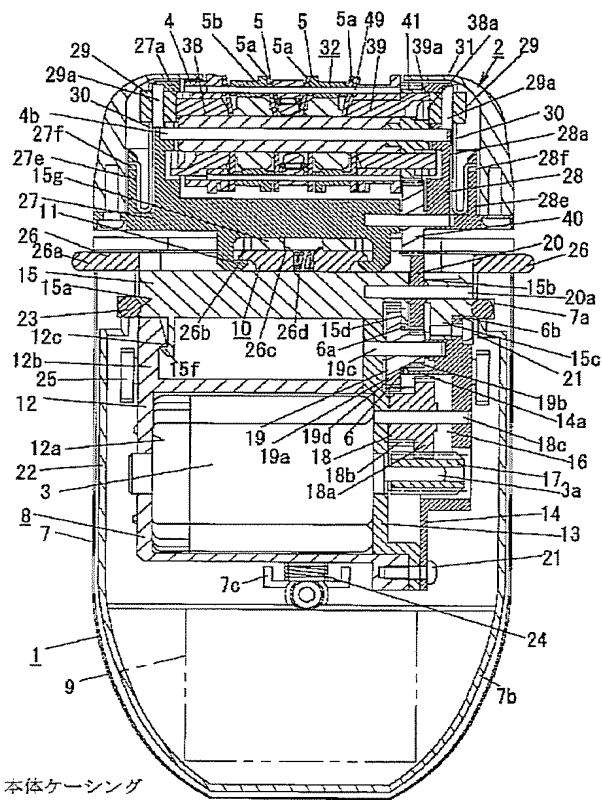




[Drawing 11]



[Drawing 1]



1 本体ケーシング

2 脱毛ヘッド

3 モーター

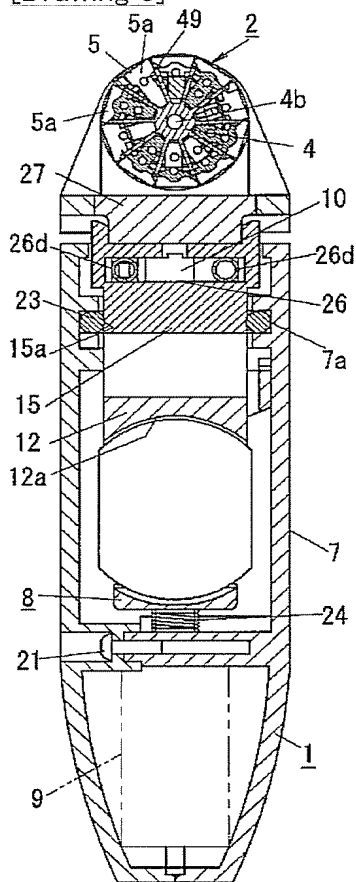
4 回転シリンダー

5 爪

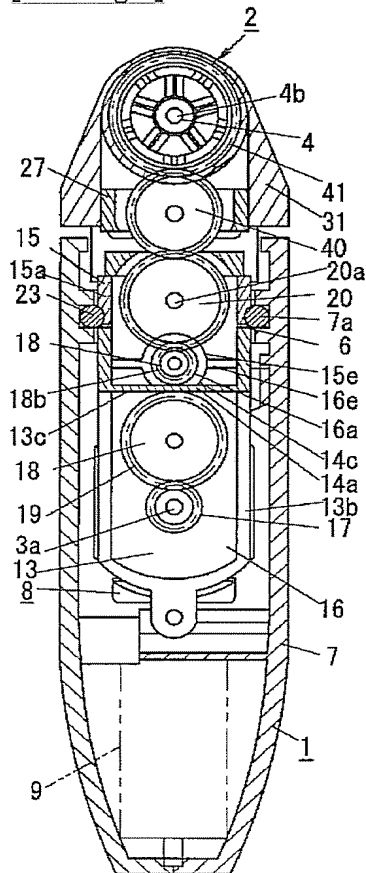
6 防水部材

8 基台

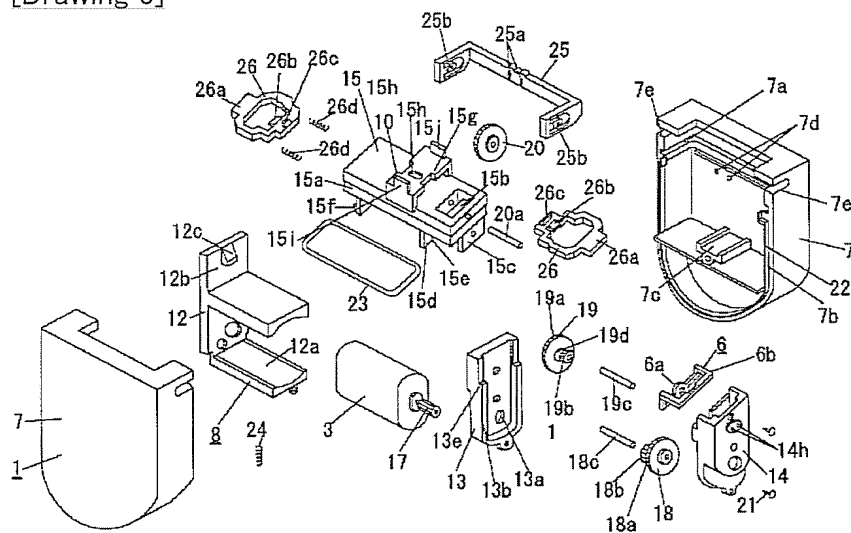
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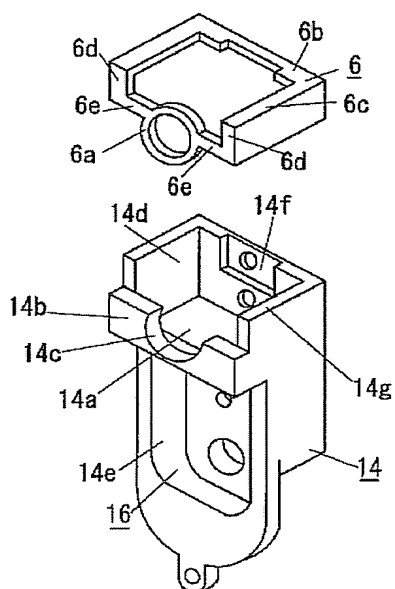
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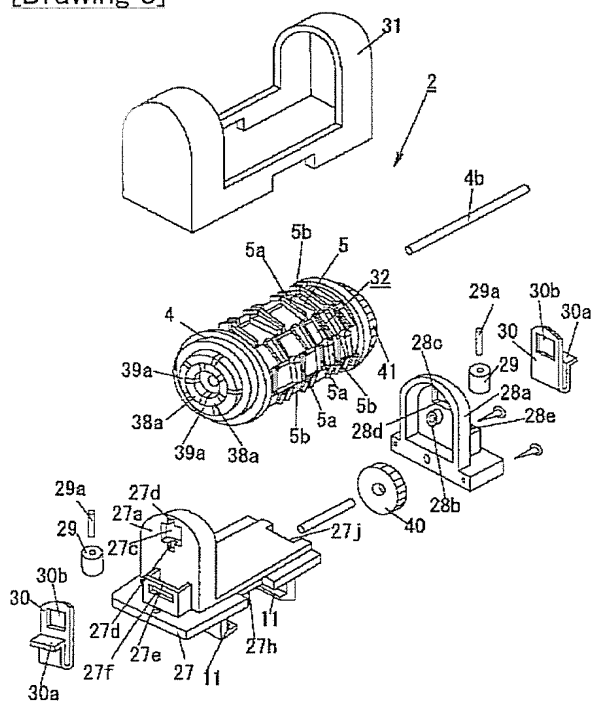
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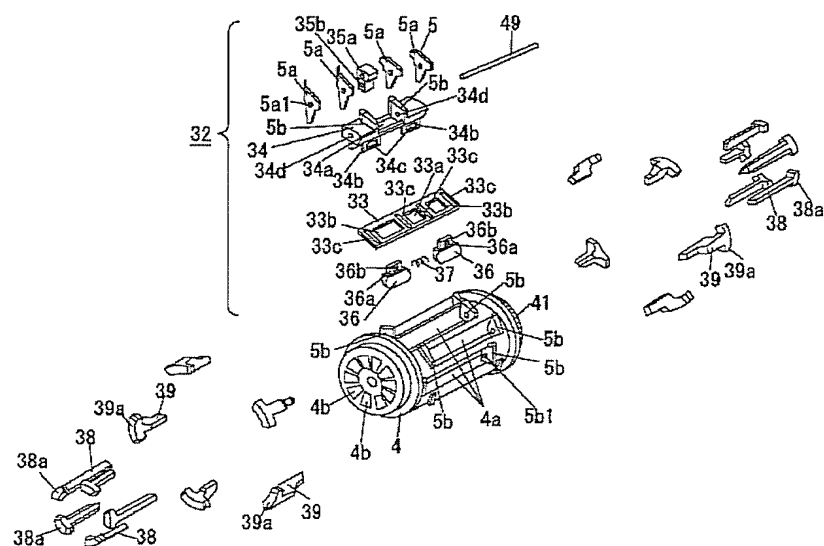
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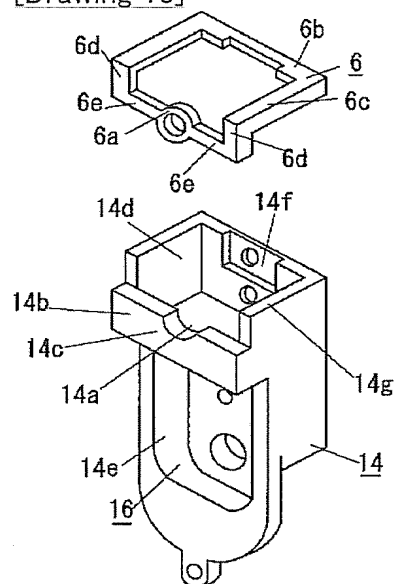
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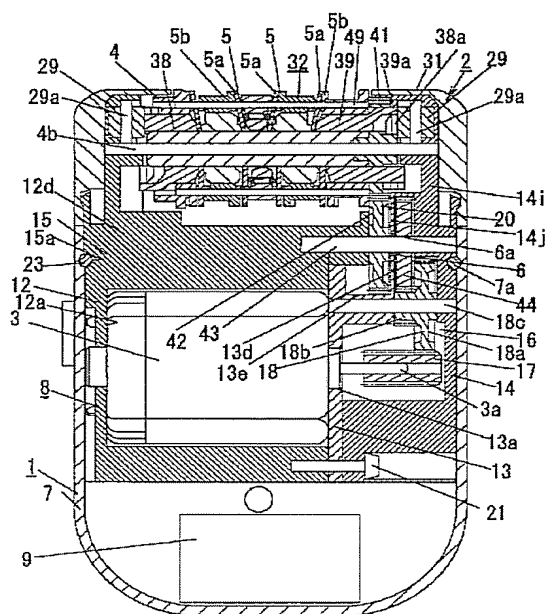
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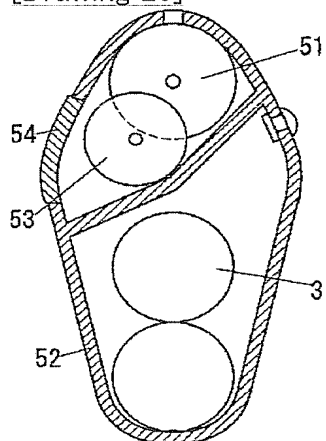
[Drawing 13]



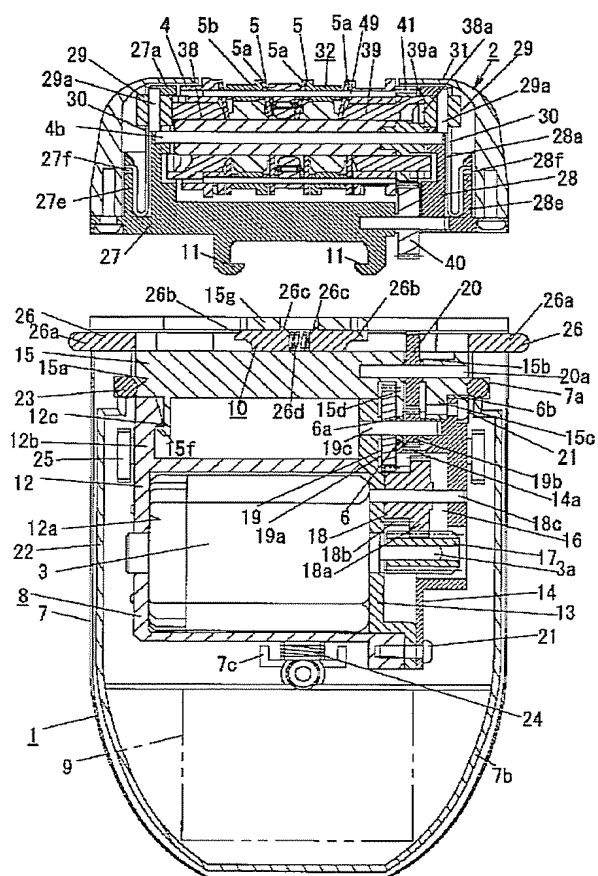
[Drawing 14]



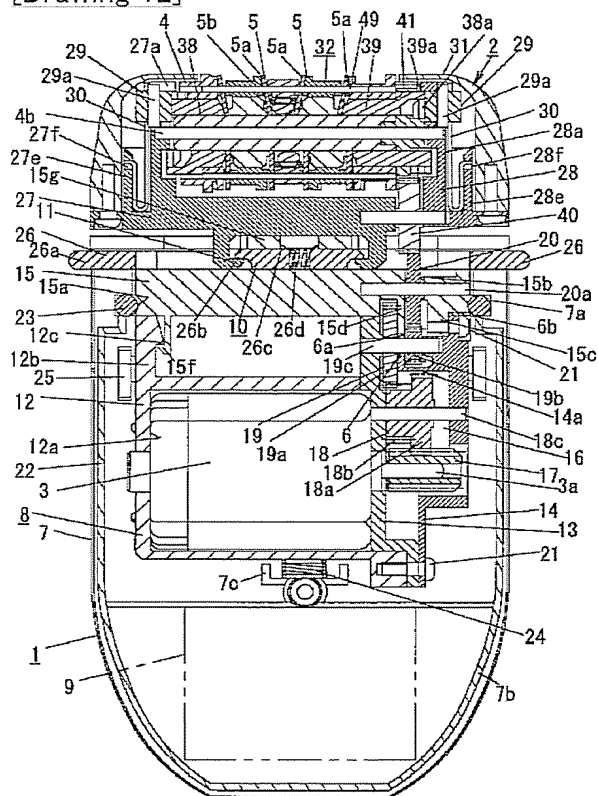
[Drawing 20]



[Drawing 10]

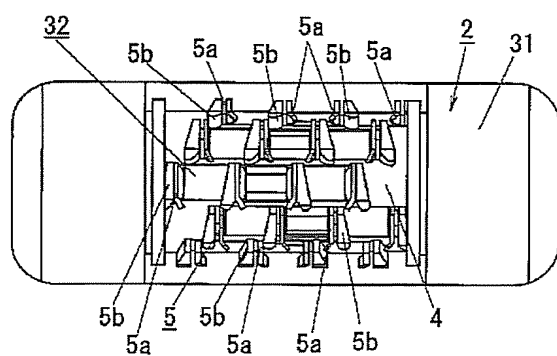


[Drawing 12]

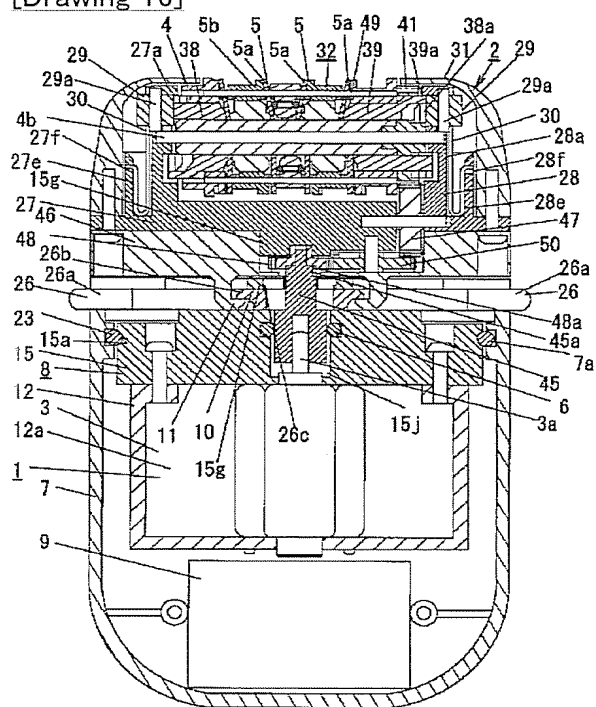


[Drawing 15]

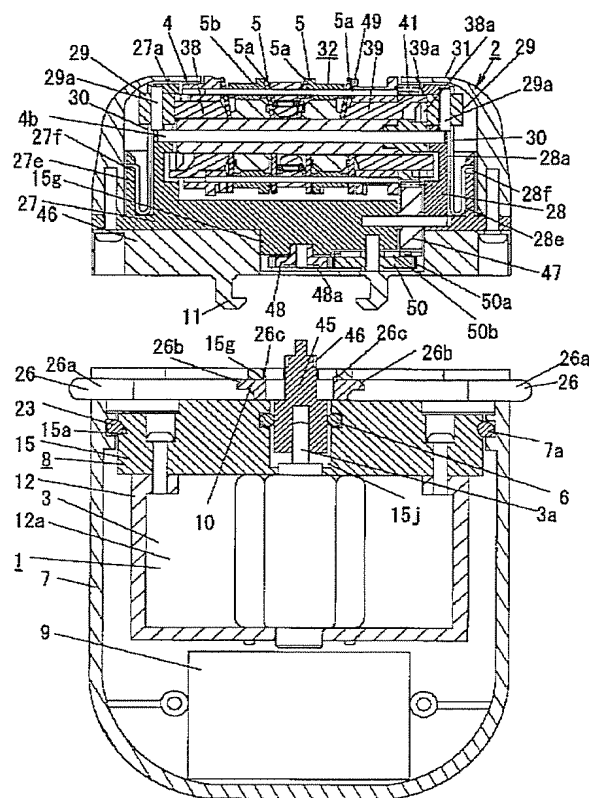




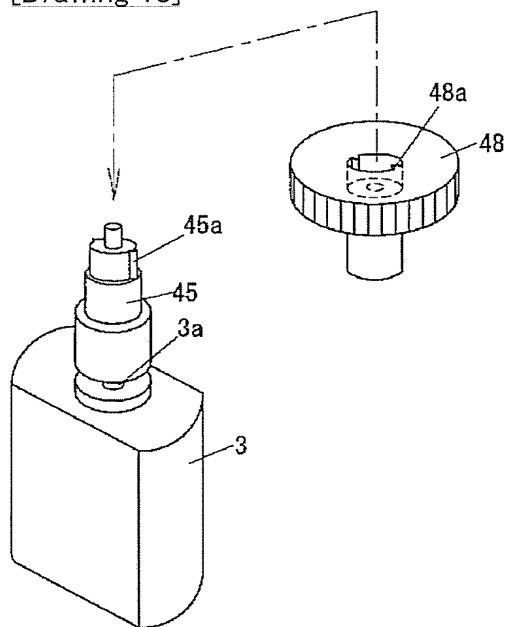
[Drawing 16]



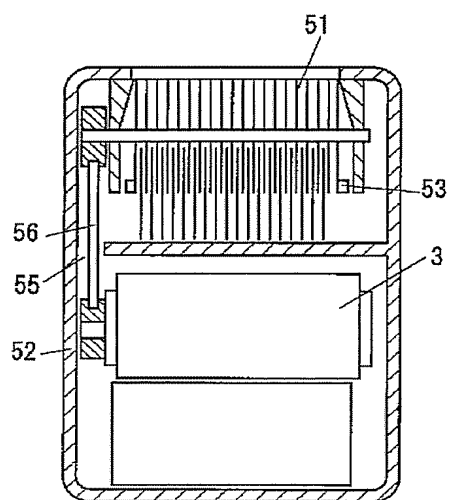
[Drawing 17]



[Drawing 18]



[Drawing 19]



[Translation done.]

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開2001-149135

(P2001-149135A)

(43)公開日 平成13年 6 月 5 日(2001. 6. 5)

(51)Int.Cl.<sup>7</sup>

A 4 5 D 26/00

識別記号

F I

A 4 5 D 26/00

テーマコード\*(参考)

F

審査請求 未請求 請求項の数50 O L (全 27 頁)

(21)出願番号 特願平11-333562

(22)出願日 平成11年11月25日(1999. 11. 25)

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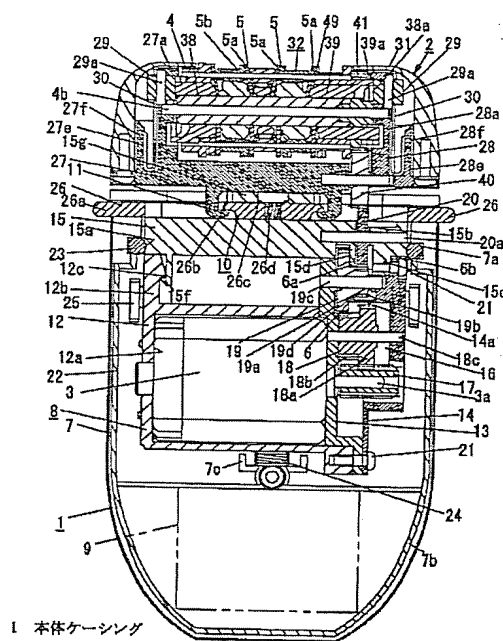
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(54)【発明の名称】 脱毛装置

(57)【要約】

【課題】 体毛や皮脂等が駆動源側に侵入することがなくて、駆動源の故障を防止することができる。回転シンダーに巻き付いたり付着している体毛や皮脂、あるいは爪に付着している体毛や皮脂を水洗いにより簡単に除去できる。

【解決手段】 手で持つことができるような把持部を有する本体ケーシング1と、開閉して毛を掴む複数の爪5を備えて、回転により毛を引き抜くための脱毛手段を有する回転シンダー4と、回転シンダー4を回転するための駆動源とを備えた脱毛装置である。駆動源から回転シンダー4に駆動伝達するための駆動伝達手段の途中に駆動源側を回転シンダー4側に対して封水するための防水部材6を設けた。



1 本体ケーシング  
2 脱毛ヘッド  
3 モータ  
4 回転シンダー

5 爪  
6 防水部材  
7 基台

## 【特許請求の範囲】

【請求項 1】 手で持つことができるような把持部を有する本体ケーシングと、開閉して毛を掴む複数の爪を備えて、回転により毛を引き抜くための脱毛手段を有する回転シリンダーと、回転シリンダーを回転するための駆動源とを備えたものにおいて、駆動源から回転シリンダーに駆動伝達するための駆動伝達手段の途中に駆動源側を回転シリンダー側に対して封水するための防水部材を設けて成ることを特徴とする脱毛装置。

【請求項 2】 駆動伝達手段が回転シリンダーに設けた歯車に駆動源からの駆動を伝達するための歯車列により構成され、歯車列に防水部材を設けて成ることを特徴とする請求項 1 記載の脱毛装置。

【請求項 3】 防水部材が、大歯車と小歯車とからなる減速歯車部分において封水していることを特徴とする請求項 2 記載の脱毛装置。

【請求項 4】 防水部材が、減速歯車部分において封水する第 1 の防水部と、歯車の軸を軸支する基台間の分離継ぎ目を封水する第 2 の防水部とを一体化したものであることを特徴とする請求項 2 記載の脱毛装置。

【請求項 5】 第 1 と第 2 の防水部は歯車の軸を軸支する一方の基台と一体に形成してあることを特徴とする請求項 4 記載の脱毛装置。

【請求項 6】 基台に軸支した軸の両側に歯車を固定し、防水部材を該軸の両歯車間において封水するように配設してあることを特徴とする請求項 2 記載の脱毛装置。

【請求項 7】 軸の両側に固定された歯車が、大歯車と小歯車とから成ることを特徴とする請求項 6 記載の脱毛装置。

【請求項 8】 本体ケーシングに内蔵した歯車列部分において防水部材により封水し、回転シリンダーが本体ケーシングに対して着脱自在となっていることを特徴とする請求項 2 記載の脱毛装置。

【請求項 9】 回転シリンダーに駆動伝達する最終段歯車の軸部分において防水部材により封水したことを特徴とする請求項 2 記載の脱毛装置。

【請求項 10】 駆動源を内蔵した本体ケーシングから駆動源により回転される回転軸を突出し、回転軸の回転が伝達されて回転する回転シリンダーを備えた脱毛ヘッドを本体ケーシングに対して着脱自在に取付け、防水部材が、回転軸部分において封水していることを特徴とする請求項 1 記載の脱毛装置。

【請求項 11】 歯車列を本体ケーシングから分離される脱毛ヘッドに設けたことを特徴とする請求項 10 記載の脱毛装置。

【請求項 12】 駆動源がモータであることを特徴とする請求項 1 記載の脱毛装置。

【請求項 13】 駆動源であるモータ及び歯車列を内蔵した基台を本体ケーシングに内装するとともに本体ケー

シングと基台の上部外周との間に第 2 の防水部材を介装して成ることを特徴とする請求項 2 又は請求項 10 記載の脱毛装置。

【請求項 14】 基台の上部に歯車列を構成する歯車の一つが位置する開口部を設け、基台内のモータと上記開口部に位置する歯車との間の駆動伝達経路の途中に防水部材を配設することを特徴とする請求項 13 記載の脱毛装置。

【請求項 15】 基台にモータを内装するモータ内装部と歯車列を内装する歯車列内装部とを設け、モータ内装部と歯車列内装部とを仕切りにより仕切って成ることを特徴とする請求項 14 記載の脱毛装置。

【請求項 16】 駆動源であるモータ及び歯車列を内蔵した基台が、複数の分割された基台を組み合わせたものであることを特徴とする請求項 4 又は請求項 14 又は請求項 15 記載の脱毛装置。

【請求項 17】 基台がモータを内装するモータ内装用基台と、モータをカバーするためのモータカバー用基台と、モータカバー用基台の外側方において歯車列をカバーするための歯車カバー基台と、モータ内装用基台とモータカバー用基台と歯車カバー基台との上部を覆う上基台とで構成され、上記複数の基台が連結固着してあることを特徴とする請求項 16 記載の脱毛装置。

【請求項 18】 モータ内装部と歯車列内装部とを仕切る仕切りがモータカバー用基台により構成してあることを特徴とする請求項 17 記載の脱毛装置。

【請求項 19】 仕切りであるモータカバー用基台に歯車カバー基台の両端部を当接した状態で固着してモータカバー用基台と歯車カバー基台とにより囲まれた空所を歯車列が内装される歯車列内装部として成ることを特徴とする請求項 18 記載の脱毛装置。

【請求項 20】 モータカバー用基台と歯車カバー基台とにより囲まれた空所よりなる歯車列内装部の上部を開口し、この開口と上基台に設けた開口部とを連通させて成ることを特徴とする請求項 19 記載の脱毛装置。

【請求項 21】 防水部材が、減速歯車部分において封水する第 1 の防水部と、歯車の軸を軸支する基台間の分離継ぎ目を封水する第 2 の防水部とを一体化したものであり、第 1 の防水部が歯車に設けたボス又は歯車の軸にはめ込むための環状体よりなり、第 2 の防水部が基台間の分離継ぎ目に沿って帯状に連続して封水するための帯状枠体よりなることを特徴とする請求項 4 又は請求項 16 記載の脱毛装置。

【請求項 22】 上基台から歯車列内装部内に垂下壁を突出し、歯車カバー基台から歯車列内装部内に突出壁を突出し、垂下壁の先端部と突出壁の先端部との間に防水部材を介在させ、垂下壁と突出壁とその間に介在させた防水部材とで歯車列内装部を上基台側に設けた開口部側とモータの出力軸が位置する側とに仕切り、防水部材の環状体の孔内を歯車のボス又は歯車の軸が水密的に貫通

していることを特徴とする請求項 21 記載の脱毛装置。

【請求項 23】 垂下壁の下端面部を防水部材の上端面に押接し、突出壁の先端部を防水部材の側面に押接して成ることを特徴とする請求項 21 記載の脱毛装置。

【請求項 24】 垂下壁の下端部に上半円状嵌め込み部を形成し、突出壁の先端部に下半円状嵌め込み部を形成し、防水部材に設けた環状体の上部を上半円状嵌め込み部にはめ込むと共に環状体の下部を下半円状嵌め込み部にはめ込んで成ることを特徴とする請求項 22 記載の脱毛装置。

【請求項 25】 垂下壁の下端面部を防水部材の上端面に押接し、突出壁の先端部に上方に向けて立ち上がった立ち上がり部を設け、この立ち上がり部を防水部材の下端面に押接して成ることを特徴とする請求項 21 又は請求項 23 記載の脱毛装置。

【請求項 26】 横向きコ字状をしたコ字状帯部の両端部から下方に向けて縦帯状部を一体に垂下するとともに縦帯状部の下端から互いに近づく方向に下横帯状部を一体に連設して帯状枠体を構成し、帯状枠体の対向する下横帯状部の先端間に環状体を一体に連設し、垂下壁を両縦帯状部間に嵌め込んで垂下壁を両縦帯状部の内面と両下横帯状部と環状体の上面とに押接するとともに上基台の下面の開口部の周囲をコ字状帯部の上端面に押接し、突出壁の先端部を下横帯状部と環状体の下端部に押接するとともに歯車カバー基台の上端部をコ字状帯部の下面に押接し、歯車カバー基台とモータカバー用基台とで縦帯状部を挟持して成ることを特徴とする請求項 21 乃至請求項 25 のいずれかに記載の脱毛装置。

【請求項 27】 モータカバー用基台から仕切り用突壁を突出し、歯車カバー基台から歯車列内装部内に突出壁を突出し、仕切り用突壁の先端部と突出壁の先端部との間に防水部材を介在させ、仕切り用突壁と突出壁とその間に介在させた防水部材とで歯車列内装部を上基台側に設けた開口部側とモータの出力軸が位置する側とに仕切り、防水部材の環状体の孔内を歯車のボス又は歯車の軸が水密的に貫通していることを特徴とする請求項 21 記載の脱毛装置。

【請求項 28】 仕切り用突壁の先端部を上方に向けて突出させて縦仕切り部とし、突出壁の先端部を下方に向けて垂下して縦仕切り部とし、両縦仕切り部間に防水部材の環状体を介在させて成ることを特徴とする請求項 27 記載の脱毛装置。

【請求項 29】 モータ内装部内に内装したモータの出力軸を歯車列内装部内に突入させ、出力軸にピニオンを固着し、大歯車と小歯車とを有する第 1 の減速歯車の大歯車を噛み合わせ、第 1 の減速歯車の小歯車に大歯車と小歯車とを有する第 2 の減速歯車の大歯車を噛み合わせ、第 2 の減速歯車の大歯車と小歯車との間の部分のボスに防水部材の環状体を嵌め込んで成ることを特徴とする請求項 3 又は請求項 21 乃至請求項 28 のいずれかに

記載の脱毛装置。

【請求項 30】 モータ内装部内に内装したモータの出力軸を歯車列内装部内に突入させ、出力軸にピニオンを固着し、大歯車と小歯車とを有する第 1 の減速歯車の大歯車を噛み合わせ、軸の両側に大歯車と小歯車とを固着して第 2 の減速歯車を構成し、第 1 の減速歯車の小歯車に第 2 の減速歯車の大歯車を噛み合わせ、第 2 の減速歯車の軸の大歯車と小歯車との間の部分に防水部材の環状体を嵌め込んで成ることを特徴とする請求項 6 又は請求項 7 又は請求項 21 乃至請求項 28 のいずれかに記載の脱毛装置。

【請求項 31】 上基台の開口部内に第 2 の減速歯車の小歯車に噛み合う出力用歯車を配置して成ることを特徴とする請求項 29 又は請求項 30 記載の脱毛装置。

【請求項 32】 第 1 の減速歯車の軸及び第 2 の減速歯車の軸の両端部がそれぞれモータカバー用基台と歯車カバー基台とに回転自在に軸支してあることを特徴とする請求項 29 又は請求項 30 記載の脱毛装置。

【請求項 33】 出力用歯車の軸の両端部が上基台の開口部の両内壁部に支持してあることを特徴とする請求項 31 記載の脱毛装置。

【請求項 34】 回転シリンダーを設けた脱毛ヘッドを本体ケーシングに対して着脱自在に取付け、脱毛ヘッドに回転シリンダーを駆動するための駆動用歯車を設け、回転シリンダーに本体ケーシングを取付けた状態で駆動用歯車を出力用歯車に着脱自在に噛み合わせて成ることを特徴とする請求項 8 又は請求項 31 記載の脱毛装置。

【請求項 35】 脱毛ヘッドの下面部に駆動用歯車を露出させ、この脱毛ヘッドの下面に本体ケーシングに着脱自在に取付けるためのフックを設け、該フックを駆動用歯車の露出位置よりも突出させて成ることを特徴とする請求項 34 記載の脱毛装置。

【請求項 36】 本体ケーシングの上面部を構成する上基台の上面部に脱毛ヘッドの下面部のフックを着脱自在に取付けるためのフック取付け部を設け、上基台の開口部に配置した出力用歯車の露出位置よりもフック取付け部を突出させて成ることを特徴とする請求項 34 記載の脱毛装置。

【請求項 37】 フック取付け部にフックとの係止を解除するための操作部を設け、この操作部を本体ケーシングに設けた孔より外方に突出させて成ることを特徴とする請求項 36 記載の脱毛装置。

【請求項 38】 上方が開口した本体ケーシングに基台を内装すると共に本体ケーシングと基台の上部外周との間に第 2 の防水部材を介装し、第 2 の防水部材による封水位置よりも本体ケーシングの上端開口よりはずれた位置に操作部を突出させる孔を形成して成ることを特徴とする請求項 37 記載の脱毛装置。

【請求項 39】 モータ内装用基台の上部の一端部と上基台の一端部とが係止手段により係止され、且つモータ

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用内装基台の下部の他端部とモータカバー用基台の下端部と歯車カバー基台の下端部とが共通のねじ具により固着され、且つ歯車カバー基台の上部が上基台の他端部にねじ具により固着してあることを特徴とする請求項 17 記載の脱毛装置。

【請求項 40】 係止手段による係止位置及び上下のねじ具による固着位置がいずれも第 2 の防水部材による防水位置よりも本体ケーシング内に位置させてあることを特徴とする請求項 39 記載の脱毛装置。

【請求項 41】 本体ケーシングが縦に 2 つ割りされた半割ケーシングを合着させて構成してあり、両半割ケーシングの合わせ部分に第 3 の防水部材を介在させて成ることを特徴とする請求項 13 記載の脱毛装置。

【請求項 42】 本体ケーシングの内面部の上部と上基台の外周面部にそれぞれ対向して第 2 の防水部材嵌め込み溝を形成し、対向する第 2 の防水部材嵌め込み溝に第 2 の防水部材の外側半部と内側半部とを嵌め込んで成ることを特徴とする請求項 13 記載の脱毛装置。

【請求項 43】 半割ケーシングの合わせ部分に第 3 の防水部材嵌め込み溝部を形成し、前後に対向する半割ケーシングの第 3 の防水部材溝嵌め込み溝部に第 3 の防水部材の前側半部と後側半部とを嵌め込んで成ることを特徴とする請求項 41 記載の脱毛装置。

【請求項 44】 本体ケーシングの内面部の上部と上基台の外周面部にそれぞれ対向して第 2 の防水部材嵌め込み溝を形成し、対向する第 2 の防水部材嵌め込み溝に第 2 の防水部材の外側半部と内側半部とを嵌め込み、半割ケーシングの合わせ部分に第 3 の防水部材嵌め込み溝部を形成し、前後に対向する半割ケーシングの第 3 の防水部材溝嵌め込み溝部に第 3 の防水部材の前側半部と後側半部とを嵌め込み、第 3 の防水部材嵌め込み溝部の端部を第 2 の防水部材嵌め込み溝部に連通させ、第 3 の防水部材嵌め込み溝部に嵌め込んだ第 3 の防水部材の端部を第 2 の防水部材嵌め込み溝部に嵌め込んだ第 2 の防水部材の下面部に押接して成ることを特徴とする請求項 41 記載の脱毛装置。

【請求項 45】 基台がモータを内装するモータ内装用基台と、モータをカバーするためのモータカバー用基台と、モータカバー用基台の外側方において歯車列をカバーするための歯車カバー基台とで構成され、上記複数の基台が連結固着され、モータ内装用基台のモータカバー用基台の取付け側と反対側の上部から上方に突出した突出支持部と、歯車カバー基台の上部から上方に突出した突出支持部とで回転シリンダーを回転自在に支持して成ることを特徴とする請求項 16 記載の脱毛装置。

【請求項 46】 モータカバー用基台から上方に向けて立設した縦仕切り部と、歯車カバー基台から下方に向けて垂設した縦仕切り部と、両縦仕切り部の先端間に介在された防水部材により構成される縦仕切り部で歯車列を内装した空所を仕切り、モータ収納用基台の上部の他端

部と縦仕切り部とに囲まれた部分を開口部とし、防水部材に設けた環状体の孔内を水密的に軸を貫通させ、この軸に縦仕切り部を介して両側にそれぞれ歯車を固着し、一方の歯車をモータ側に位置させてモータからの回転が伝達される入力側歯車とし、他方の歯車を開口部内に位置させて出力用歯車として成ることを特徴とする請求項 28 又は請求項 45 記載の脱毛装置。

【請求項 47】 出力用歯車を回転シリンダーに設けた歯車に噛合して成ることを特徴とする請求項 9 又は請求項 46 記載の脱毛装置。

【請求項 48】 第 1 と第 2 の防水部よりなる防水部材を歯車カバー基台に一体に形成して成ることを特徴とする請求項 5 又は請求項 17 又は請求項 45 記載の脱毛装置。

【請求項 49】 駆動源であるモータを内蔵した基台を本体ケーシングに内装するとともに本体ケーシングと基台の上部外周との間に第 2 の防水部材を介装し、基台の上部に設けた孔にモータにより回転される回転軸を挿通して外部に突出させ、該基台の上部に設けた孔の内周面部と回転軸の外周部との間に防水部材を介装して成ることを特徴とする請求項 10 又は請求項 11 記載の脱毛装置。

【請求項 50】 回転軸の上端部に係合部を設け、脱毛ヘッドに設けた歯車列の始端の歯車に回転軸を抜き差し自在にはめ込むための嵌め込み穴を形成すると共に嵌め込み穴に係合部に着脱自在に係合する被係合部を設けて成ることを特徴とする請求項 11 又は請求項 49 記載の脱毛装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、美容などの目的のために体毛を除去するのに使用される脱毛装置に関するものである。

【0002】

【従来の技術】 従来から、美容などの目的のために体毛を除去するのに使用される脱毛装置として特開平 9-308521 号公報が知られている。この特開平 9-308521 号公報に示された従来例は、図 19、図 20 に示されるようなもので、モータ 3 を回転してベルト 56 を介して複数の円板を備えたローラユニット 51 を回転し、ローラユニット 51 を回転しながら円板で体毛を挟んで引き抜くようになっており、また、ケーシング 52 内に剛毛のブラシからなる清掃エレメント 53 を設け、体毛を掴んで抜く円板に溜まっている体毛を掃除エレメントにより除去し、体毛を仕切りに落とすようにしており、落とした体毛はカバー 54 を外すことで除去するようになっている。

【0003】 ところが、上記の従来例にあつては、剛毛ブラシからなる清掃エレメント 53 により円板に溜まった体毛を除去するようにしているが、体毛の除去が十分



ではなく、また、皮脂の除去が不十分であるという問題があった。

【0004】しかも、図19のように、モータ3の回転をベルト56を介してローラユニット51に伝達しており、このベルト56を配置した部分にはローラユニット51とモータ3との間に隙間55が生じており、この隙間55部分からモータ3側に体毛や皮脂が侵入してしまうという問題があり、更に、このようにローラユニット51とモータ3との間に隙間55が生じるため、体毛や皮脂が付着したローラユニット51部分の水洗いもでき

【0005】

【発明が解決しようとする課題】本発明は上記の点に鑑みてなされたものであり、体毛や皮脂等が駆動源側に侵入することがなくて、駆動源の故障を防止することができ、また、回転シリンダーに巻き付いたり付着している体毛や皮脂、あるいは爪に付着している体毛や皮脂を水洗いにより簡単に除去することが可能な脱毛装置を提供することを課題とするものである。

【0006】

【課題を解決するための手段】上記課題を解決するために本発明に係る脱毛装置は、手で持つことができるような把持部を有する本体ケーシング1と、開閉して毛を掴む複数の爪5を備えて、回転により毛を引き抜くための脱毛手段を有する回転シリンダー4と、回転シリンダー4を回転するための駆動源とを備えたものにおいて、駆動源から回転シリンダー4に駆動伝達するための駆動伝達手段の途中に駆動源側を回転シリンダー4側に対して封水するための防水部材6を設けて成ることを特徴とするものである。このような構成とすることで、体毛や皮脂が駆動源側に侵入するのを防水部材6により防止することができ、また、回転シリンダー4や爪5を水洗いすることで、回転シリンダー4に巻き付いたり付着している毛（ここで毛とは引き抜かれた体毛、あるいは引き抜き時にちぎれた毛等のことをいう）や皮脂、あるいは爪5に付着している毛や皮脂を簡単に除去することができ、この場合も防水部材6により水が駆動源側に浸入するのを防止することができて、水洗いをして支障がないものである。

【0007】また、駆動伝達手段が回転シリンダー4に設けた歯車に駆動源からの駆動を伝達するための歯車列により構成され、歯車列に防水部材6を設けることが好ましい。このような構成とすることで、従来のように回転シリンダー4を回転するに当たってベルトにより駆動を伝達するものに比べて、回転シリンダー4に設けた歯車に駆動を伝達する歯車列部分に防水部材6を設けて防水することで、簡単な構成で防水することが可能となるものである。

【0008】また、防水部材6が、大歯車と小歯車とからなる減速歯車部分において封水することが好ましい。

このような構成とすることで、減速歯車は大歯車と小歯車とで構成することで、コンパクト化が図れ、また、減速歯車の大歯車と小歯車との間に防水部材6を介在させることで、簡単な構成で歯車列の途中において駆動源側を回転シリンダー4側に対して封水することができるものである。

【0009】また、防水部材6が、減速歯車部分において封水する第1の防水部と、歯車の軸を軸支する基台8間の分離継ぎ目を封水する第2の防水部とを一体化したものであることが好ましい。このような構成とすることで、歯車列の途中において駆動源側を回転シリンダー4側に対して封水するに当たり、単一の防水部材6により減速歯車部分だけでなく歯車の軸を軸支する基台8間の分離継ぎ目部分も封水することができることになる。

【0010】また、第1と第2の防水部は歯車の軸を軸支する一方の基台8と一体に形成してあることが好ましい。このように防水部材6と一方の基台8とを一体化することで部材点数を削減することができるものである。

【0011】また、基台8に軸支した軸の両側に歯車を固定し、防水部材6を該軸の両歯車間において封水するように配設してあることが好ましい。このような構成とすることで、減速歯車の軸の両側に固定した歯車間の軸部分において防水部材6により封水するという簡単な構成で、駆動源側を回転シリンダー4側に対して封水することができるものである。

【0012】また、軸の両側に固定された歯車が、大歯車と小歯車とからなることが好ましい。このような構成とすることで、軸の両側に固定された大歯車と小歯車とが減速歯車を構成することによってコンパクト化が図れ、また、簡単な構成で減速歯車を構成して大歯車と小歯車との間に防水部材6を介在させることができるものである。

【0013】また、本体ケーシング1に内蔵した歯車列部分において防水部材6により封水し、回転シリンダー4が本体ケーシング1に対して着脱自在となっていることが好ましい。このような構成とすることで、回転シリンダー4を本体ケーシング1から外して掃除することができて本体ケーシング1側のギア列の一部を掃除することが可能となり、また、回転シリンダー4を外して回転シリンダー4側のみ水洗いするということも可能となるものである。

【0014】また、回転シリンダー4に駆動伝達する最終段歯車の軸部分において防水部材6により封水したことが好ましい。このような構成とすることで、毛や皮脂がギア列を配置した部分の内部に侵入するのを防止し、この結果、掃除に当たっては主として回転シリンダー4側を掃除すればよく、また、水洗いで簡単に毛や皮脂を落とすことができるものである。

【0015】また、駆動源を内蔵した本体ケーシング1から駆動源により回転される回転軸を突出し、回転軸の

回転が伝達されて回転する回転シリンダー 4 を備えた脱毛ヘッド 2 を本体ケーシング 1 に対して着脱自在に取付け、防水部材 6 が、回転軸部分において封水していることが好ましい。このような構成とすることで、防水部材 6 を駆動源側の回転軸に取付けて封水するという簡単な構成で駆動源側を回転シリンダー 4 側に対して封水することができ、歯車列部分に防水手段を取付けて封水する場合に比べて防水部材 6 の構造が簡略化でき、また、掃除に当たっては脱毛ヘッド 2 を取り外して脱毛ヘッド 2 側を主として掃除すればよく、また、水洗いも脱毛ヘッド 2 を取り外して脱毛ヘッド 2 側を簡単に水洗いすることができるものである。

【0016】また、歯車列を本体ケーシング 1 から分離される脱毛ヘッド 2 に設けたことが好ましい。このような構成とすることで、ギア列に巻き込む毛を簡単に洗い落とすことができるものである。

【0017】また、駆動源がモータ 3 であることが好ましい。そして、駆動源であるモータ 3 及び歯車列を内蔵した基台 8 を本体ケーシング 1 に内装するとともに本体ケーシング 1 と基台 8 の上部外周との間に第 2 の防水部材 23 を介装してあることが好ましい。このような構成とすることで、第 2 の防水部材 23 により本体ケーシング 1 と基台との間から毛や皮脂が侵入するのを防止でき、また、水洗いした際にも本体ケーシング 1 と基台 8 との間から水が内部に浸入するのを防止でき、この結果、モータ 3 及び歯車列を内蔵した基台 8 を上部のみが本体ケーシング 1 と第 2 の防水部材 23 を介して水封できる構造とすればよく、基台 8 の上部以外の部分の構造を簡略化できることになる。

【0018】また、基台の上部に歯車列を構成する歯車の一つが位置する開口部 15b を設け、基台内のモータ 3 と上記開口部 15b に位置する歯車との間の駆動伝達経路の途中に防水部材 6 を配設することが好ましい。このような構成とすることで、モータ 3 と基台 8 の開口部 15b との間において防水部材 6 によりモータ 3 側に毛や皮脂や水等が入らない構造とすることができるものである。

【0019】また、基台 8 にモータ 3 を内装するモータ内装部 12a と歯車列を内装する歯車列内装部 16 とを設け、モータ内装部 12a と歯車列内装部 16 とを仕切りにより仕切っていることが好ましい。このような構成とすることで、仕切りにより歯車列側からモータ 3 側に毛や皮脂や水等が入らないようにすることができるものである。

【0020】また、駆動源であるモータ 3 及び歯車列を内蔵した基台 8 が、複数の分割された基台 8 を組み合わせたものであることが好ましい。このような構成とすることで、基台 8 への駆動源の組み込みや歯車列の組み込みを簡単に行うことができるものである。

【0021】また、基台 8 がモータ 3 を内装するモータ

内装用基台 12 と、モータ 3 をカバーするためのモータカバー用基台 13 と、モータカバー用基台 13 の外側方において歯車列をカバーするための歯車カバー基台 14 と、モータ内装用基台 12 とモータカバー用基台 13 と歯車カバー基台 14 との上部を覆う上基台 15 とで構成され、上記複数の基台 8 が連結固着してあることが好ましい。このような構成とすることで、モータ 3 をモータ内装用基台 12 に内装し、モータ 3 をモータカバー用基台 13 によりカバーし、更に、歯車列をモータカバー用基台 13 と歯車カバー基台 14 との間に取付けて歯車カバー基台 14 によりカバーするというようにして簡単にモータ 3、歯車列を組み込むことができるものである。そして、上基台 15 を設けることで、本体ケーシング 1 と第 2 の防水部材 23 により封水する部分が上基台 15 という一つの部材の外周部において行えばよく、本体ケーシング 1 との封水が簡略化できることになる。

【0022】また、モータ内装部 12a と歯車列内装部 16 とを仕切る仕切りがモータカバー用基台 13 により構成してあることが好ましい。このような構成とすることで、3 部材に分割された基台の一つであるモータカバー用基台 13 が仕切りを兼ねることになって構造が簡略化できるものである。

【0023】また、仕切りであるモータカバー用基台 13 に歯車カバー基台 14 の両端部を当接した状態で固着してモータカバー用基台 13 と歯車カバー基台 14 とにより囲まれた空所を歯車列が内装される歯車列内装部 16 としてあることが好ましい。このような構成とすることで、歯車列内装部 16 に歯車列を内装し、この歯車列の途中に防水部材 6 を設けて防水部材 6 によりモータ 3 側を封水するに当たり、防水部材 6 部分で仕切る歯車列内装部 16 の周囲がモータカバー用基台 13 と歯車カバー基台 14 とで囲まれて封水されることになって、封水構造が簡略化するものである。

【0024】また、モータカバー用基台 13 と歯車カバー基台 14 とにより囲まれた空所よりなる歯車列内装部 16 の上部を開口し、この開口と上基台 15 に設けた開口部 15b とを連通させることが好ましい。このような構成とすることで、歯車列内装部 16 に内装した歯車列の一部を上基台 15 の開口部 15b に位置させることができるものである。

【0025】また、防水部材 6 が、減速歯車部分において封水する第 1 の防水部と、歯車の軸を軸支する基台間の分離継ぎ目を封水する第 2 の防水部とを一体化したものであり、第 1 の防水部が歯車に設けたボス又は歯車の軸にはめ込むための環状体 6a よりなり、第 2 の防水部が基台 8 間の分離継ぎ目に沿って帯状に連続して封水するための帯状枠体 6b よりなることが好ましい。このような構成とすることで、環状体 6a を歯車に設けたボス又は歯車の軸にはめ込むことで、歯車列の途中で封水することができ、また、帯状枠体 6b を介して分割した基

台 8 間の分離継ぎ目部分を封水することができ、この歯車列の途中における封水と基台 8 間の分離継ぎ目部分の封水とが一つの防水部材 6 により連続して行えることになる。

【0026】また、上基台 15 から歯車列内装部 16 内に垂下壁を突出し、歯車カバー基台 14 から歯車列内装部 16 内に突出壁 14 a を突出し、垂下壁 15 d の先端部と突出壁 14 a の先端部との間に防水部材 6 を介在させ、垂下壁 15 d と突出壁 14 a とその間に介在させた防水部材 6 とで歯車列内装部 16 を上基台 15 側に設けた開口部側とモータ 3 の出力軸が位置する側とに仕切り、防水部材 6 の環状体の孔内を歯車のボス又は歯車の軸が水密的に貫通していることが好ましい。このような構成とすることで、簡単な構成で歯車列内装部 16 内を防水部材 6 を介して歯車のボス又は歯車の軸部分で開口部 15 b 側とモータ 3 側とに封水構造により仕切ることができるものである。

【0027】また、垂下壁 15 d の下端面部を防水部材 6 の上端面に押接し、突出壁 14 a の先端部を防水部材 6 の側面に押接することが好ましい。このような構成とすることで、防水部材 6 を介して垂下壁 15 d と突出壁 14 a との間が密閉されて簡単に歯車列内装部 16 内を防水部材 6 を介して歯車のボス又は歯車の軸部分で開口部 15 b 側とモータ 3 側とに封水構造により仕切ることができるものである。

【0028】また、垂下壁 15 d の下端部に上半円状嵌め込み部 15 e を形成し、突出壁 14 a の先端部に下半円状嵌め込み部 14 c を形成し、防水部材 6 に設けた環状体 6 a の上部を上半円状嵌め込み部 15 e にはめ込むと共に環状体 6 a の下部を下半円状嵌め込み部 14 c にはめ込むことが好ましい。このような構成とすることで、防水部材 6 に設けた環状体 6 a の位置決めが確実になされるとともに環状体 6 a と垂下壁 15 d、突出壁 14 a との封水が簡単にできることになる。

【0029】また、垂下壁 15 d の下端面部を防水部材 6 の上端面に押接し、突出壁 14 a の先端部に上方に向けて立ち上がった立ち上がり部 14 b を設け、この立ち上がり部 14 b を防水部材 6 の下端面に押接することが好ましい。このような構成とすることで、防水部材 6 が垂下壁 15 d と立ち上がり部 14 b とで上下から挟持されて確実な封水ができるとともに、防水部材 6 の取付けが確実に行えるものである。

【0030】また、横向きコ字状をしたコ字状帯部 6 c の両端部から下方に向けて縦帯部 6 d を一体に垂下するとともに縦帯部 6 d の下端から互いに近づく方向に下横帯部 6 e を一体に連設して帯状枠体を構成し、帯状枠体の対向する下横帯部 6 e の先端間に環状体 6 a を一体に連設し、垂下壁 15 d を両縦帯部 6 d 間に嵌め込んで垂下壁 15 d を両縦帯部 6 d の内面と両下横帯部 6 e と環状体 6 a の上面とに押接するとともに上

基台 15 の下面の開口部の周囲をコ字状帯部 6 c の上端面に押接し、突出壁 14 a の先端部を下横帯部 6 e と環状体 6 a の下端部に押接するとともに歯車カバー基台 14 の上端部をコ字状帯部 6 c の下面に押接し、歯車カバー基台 14 とモータカバー用基台 13 とで縦帯部 6 d を挟持してあることが好ましい。このような構成とすることで、簡単な構成で防水部材 6 を上基台 15 と歯車カバー基台 14 とモータカバー用基台 13 との 3 つに分割した基台 8 の継ぎ目部分に沿って位置させて防水部材 6 が 3 つの基台により確実に支持して各基台 8 同士の継ぎ目部分の封水を行うことができるものである。

【0031】また、モータカバー用基台 13 から仕切り用突壁 13 e を突出し、歯車カバー基台 14 から歯車列内装部 16 内に突出壁 14 a を突出し、仕切り用突壁 13 e の先端部と突出壁 14 a の先端部との間に防水部材 6 を介在させ、仕切り用突壁と突出壁 14 a とその間に介在させた防水部材 6 とで歯車列内装部 16 を上基台 15 側に設けた開口部側とモータ 3 の出力軸が位置する側とに仕切り、防水部材 6 の環状体 6 a の孔内を歯車のボス又は歯車の軸が水密的に貫通していることが好ましい。このような構成とすることで、簡単な構成で歯車列内装部 16 内を防水部材 6 を介して歯車のボス又は歯車の軸部分で開口部 15 b 側とモータ 3 側とに封水構造により仕切ることができるものである。

【0032】また、仕切り用突壁 13 e の先端部を上方に向けて突出させて縦仕切り部 13 d とし、突出壁 14 a の先端部を下方に向けて垂下して縦仕切り部 14 j とし、両縦仕切り部 13 d、14 j 間に防水部材 6 の環状体 6 a を介在させることが好ましい。このような構成とすることで、縦仕切り部 13 d と縦仕切り部 14 j とで上下より防水部材 6 の環状体 6 a を挟持して封水構造とすることができるものである。

【0033】また、モータ内装部 12 a 内に内装したモータ 3 の出力軸 3 a を歯車列内装部 16 内に突入させ、出力軸 3 a にピニオン 17 を固着し、大歯車と小歯車とを有する第 1 の減速歯車の大歯車を噛み合わせ、第 1 の減速歯車の小歯車に大歯車と小歯車とを有する第 2 の減速歯車の大歯車を噛み合わせ、第 2 の減速歯車の大歯車と小歯車との間の部分のボスに防水部材 6 の環状体 6 a を嵌め込むことが好ましい。このような構成とすることで、複数の減速歯車のうち回転シリンダー 4 に近い方の減速歯車部分において防水部材 6 を取付けて封水することができ、モータ 3 に近い側の減速歯車側に毛や油脂や水が入らないようにできるものである。

【0034】また、モータ内装部 12 a 内に内装したモータ 3 の出力軸 3 a を歯車列内装部 16 内に突入させ、出力軸にピニオン 17 を固着し、大歯車と小歯車とを有する第 1 の減速歯車の大歯車を噛み合わせ、軸の両側に大歯車と小歯車とを固着して第 2 の減速歯車を構成し、第 1 の減速歯車の小歯車に第 2 の減速歯車の大歯車を噛

み合わせ、第2の減速歯車の軸の大歯車と小歯車との間の部分に防水部材6の環状体6aを嵌め込むことが好ましい。このような構成とすることで、複数の減速歯車のうち回転シリンダー4に近い方の減速歯車部分において防水部材6を取付けて封水することができ、モータ3に近い側の減速歯車側に毛や皮脂や水が入らないようにできるものである。

【0035】また、上基台15の開口部内に第2の減速歯車の小歯車に噛み合う出力用歯車20を配置することが好ましい。このような構成とすることで、簡単な構成で、基台側に設けた歯車列からの出力を本体ケーシング1に対して外周部を第2の防水部材23により封水した上基台15の開口部において行うことができるものである。

【0036】また、第1の減速歯車の軸及び第2の減速歯車の軸の両端部がそれぞれモータカバー用基台13と歯車カバー基台14とに回転自在に軸支してあることが好ましい。このような構成とすることで、第1の減速歯車、第2の減速歯車を基台8に組み込んで支持するのが簡単に行えるものである。

【0037】また、出力用歯車20の軸の両端部が上基台15の開口部15bの両内壁部に支持してあることが好ましい。このような構成とすることで出力用歯車を開口部に取付けた上基台15を第2の減速歯車を組み込んだモータカバー用基台13と歯車カバー基台14との上部に取付けることで、簡単に第2の減速歯車と出力用歯車20とを噛み合わせて歯車列を組み立てることができるものである。

【0038】また、回転シリンダー4を設けた脱毛ヘッド2を本体ケーシング1に対して着脱自在に取付け、脱毛ヘッド2に回転シリンダー4を駆動するための駆動用歯車40を設け、回転シリンダー4に本体ケーシング1を取付けた状態で駆動用歯車40を出力用歯車20に着脱自在に噛み合わせることが好ましい。このような構成とすることで、回転シリンダー4を設けた脱毛ヘッド2を本体ケーシング1に着脱するに当たり、簡単な構成で回転シリンダー4にモータ3の回転を伝達して回転シリンダー4を回転することができ、しかも、掃除に当たっては、脱毛ヘッド2を外すことで、隅々まで掃除ができ、また、水洗いする際にも脱毛ヘッド2を外して脱毛ヘッド2側のみを水洗いするということが可能となるものである。

【0039】また、脱毛ヘッド2の下面部に駆動用歯車40を露出させ、この脱毛ヘッド2の下面に本体ケーシング1に着脱自在に取付けるためのフック11を設け、該フック11を駆動用歯車40の露出位置よりも突出させることが好ましい。このような構成とすることで、脱毛ヘッド2を外した場合、駆動用歯車40がフックよりも内側に位置することになって、駆動用歯車40が他の物に当たって破損したりするのを防止することができる

ものである。

【0040】また、本体ケーシング1の上面部を構成する上基台15の上面部に脱毛ヘッド2の下面部のフック11を着脱自在に取付けるためのフック取付け部10を設け、上基台15の開口部15bに配置した出力用歯車20の露出位置よりもフック取付け部10を突出させることが好ましい。このような構成とすることで、脱毛ヘッド2を外した場合、出力用歯車20がフック取付け部10よりも内側に位置することになって、出力用歯車20が他の物に当たって破損したりするのを防止することができるものである。

【0041】また、フック取付け部10にフック11との係止を解除するための操作部26aを設け、この操作部26aを本体ケーシング1に設けた孔より外方に突出させることが好ましい。このような構成とすることで、本体ケーシング1の孔から外方に突出した操作部26aを操作することで簡単にフック取付け部10とフック11との係止を解除することができるものである。

【0042】また、上方が開口した本体ケーシング1に基台を内装すると共に本体ケーシング1と基台8の上部外周との間に第2の防水部材23を介装し、第2の防水部材23による封水位置よりも本体ケーシング1の上端開口よりはずれた位置に操作部26aを突出させる孔を形成することが好ましい。このような構成とすることで、操作部26aを突出させる孔から本体ケーシング1内に毛や皮脂や水が入っても、この毛や皮脂や水が本体ケーシング1のモータ3を内装した部分には入らないものである。

【0043】また、モータ内装用基台12の上部の一端部と上基台15の一端部とが係止手段により係止され、且つモータ3用内装基台の下部の他端部とモータカバー用基台13の下端部と歯車カバー基台14の下端部とが共通のねじ具21により固着され、且つ歯車カバー基台14の上部が上基台15の他端部にねじ具21により固着してあることが好ましい。このような構成とすることで、3分割されたモータ内装用基台12とモータカバー用基台13と歯車カバー基台14とを簡単に組立固着することができるものである。

【0044】また、係止手段による係止位置及び上下のねじ具21による固着位置がいずれも第2の防水部材23による封水位置よりも本体ケーシング1内に位置させることが好ましい。このように分割されたモータ内装用基台12とモータカバー用基台13と歯車カバーとの組立固着位置が第2の防水部材23よりも本体ケーシング1内にあることで、係止や固着部分からの毛や皮脂や水の侵入防止を考慮する必要がなくて分割された基台8の組立固着の構造が簡略化するものである。

【0045】また、本体ケーシング1が縦に2つ割りされた半割ケーシング7を合着させて構成してあり、両半割ケーシング7の合わせ部分に第2の防水部材23を介

在させることが好ましい。このように本体ケーシング 1 を半割ケーシング 7 を合着させて構成することで、内部への基台等の組み込みが容易に行え、また、2 つ割られた構成であるにもかかわらず、第 2 の防水部材 23 を介在することで、半割ケーシング 7 の合わせ部分から本体ケーシング 1 の内部に毛や皮脂や水が侵入するのが確実に防止できるものである。

【0046】また、本体ケーシング 1 の内面部の上部と上基台 15 の外周面部にそれぞれ対向して第 2 の防水部材 15a、7a を形成し、対向する第 2 の防水部材 15a、7a に第 2 の防水部材 23 の外側半部と内側半部とを嵌め込むことが好ましい。このような構成とすることで、本体ケーシング 1 の内面部と上基台 15 の外周面部とを第 2 の防水部材 23 で水封するに当たって、第 2 の防水部材 23 を本体ケーシング 1 及び上基台 15 に対して位置決めした状態で取付けることができ、これにより、本体ケーシング 1 に対して基台 8 を第 2 の防水部材 23 を介して位置決め支持することができるものであって、基台 8 に内蔵したモータ 3 の振動が第 2 の防水部材 23 により減衰されて本体ケーシング 1 側に伝わりにくい構成にできるものである。

【0047】また、半割ケーシング 7 の合わせ部分に第 3 の防水部材 7b を形成し、前後に対向する半割ケーシング 7 の第 2 の防水部材 7b に第 2 の防水部材 23 の前側半部と後側半部とを嵌め込むことが好ましい。このような構成とすることで、半割ケーシング 7 の所定の位置に第 2 の防水部材 23 を位置決めでき、このように位置決めされた第 2 の防水部材 23 を介して半割ケーシング 7 同士を正確な位置関係で位置合わせすることができ、

【0048】また、本体ケーシング 1 の内面部の上部と上基台 15 の外周面部にそれぞれ対向して第 2 の防水部材 15a、7a を形成し、対向する第 2 の防水部材 15a、7a に第 2 の防水部材 23 の外側半部と内側半部とを嵌め込み、半割ケーシング 7 の合わせ部分に第 3 の防水部材 7b を形成し、前後に対向する半割ケーシング 7 の第 2 の防水部材 7b に第 2 の防水部材 23 の前側半部と後側半部とを嵌め込み、第 3 の防水部材 7b の端部を第 2 の防水部材 7a に連通させ、第 2 の防水部材 7b に嵌め込んだ第 2 の防水部材 23 の端部を第 2 の防水部材 7a に嵌め込んだ第 2 の防水部材 23 の下面部に押接することが好ましい。このような構成とすることで、第 2 の防水部材 23 と第 3 の防水部材 22 とで半割ケーシング 7 の合わせ部分及び本体ケーシング 1 の内周部と上基台 15 の外周面部との間の部分を連続して封水することができることになる。

【0049】また、基台 8 がモータ 3 を内装するモータ内装用基台 12 と、モータ 3 をカバーするためのモータ

カバー用基台 13 と、モータカバー用基台 13 の外側方において歯車列をカバーするための歯車カバー基台 14 とで構成され、上記複数の基台が連結固着され、モータ内装用基台 12 のモータカバー用基台 13 の取付け側と反対側の上部から上方に突出した突出支持部と、歯車カバー基台 14 の上部から上方に突出した突出支持部とで回転シリンダー 4 を回転自在に支持することが好ましい。このような構成とすることで、簡単な構成でモータ 3、歯車列を内装し、回転シリンダー 4 を回転自在に支持する基台を構成でき、この基台を複数の基台に分割することでモータ 3、歯車列、回転シリンダー 4 の組み込みが容易に行えることになる。

【0050】また、モータカバー用基台 13 から上方に向けて立設した縦仕切り部と、歯車カバー基台 14 から下方に向けて垂設した縦仕切り部と、両縦仕切り部の先端間に介在された防水部材 6 により構成される縦仕切り部で歯車列を内装した空所を仕切り、モータ 3 収納用基台の上部の他端部と縦仕切り部とに囲まれた部分を開口部とし、防水部材 6 に設けた環状体 6a の孔内を水密的に軸を貫通させ、この軸に縦仕切り部を介して両側にそれぞれ歯車を固着し、一方の歯車をモータ 3 側に位置させてモータ 3 からの回転が伝達される入力側歯車 44 とし、他方の歯車を開口部内に位置させて出力用歯車 20 とすることが好ましい。このような構成とすることで、縦仕切り部で歯車列の途中を水密的に仕切ることで縦仕切りより内側に毛や皮脂や水が入らないようにでき、また、縦仕切り部を介して両側に位置する歯車のうち他方が開口部内に位置して出力用歯車 20 となっていることで、開口部部分に位置する出力用歯車 20 よりもモータ 3 側の歯車列に毛や皮脂や水が入ることがなく、開口部に位置する出力用歯車 20 のみを掃除すればよくて、掃除が容易となるものである。

【0051】また、出力用歯車 20 を回転シリンダー 4 に設けた歯車に噛合することが好ましい。このような構成とすることで、脱毛ヘッド 2 側においては回転シリンダー 4 に設けた歯車以外には歯車がなく、脱毛ヘッド 2 側の掃除が簡単に行えるものである。

【0052】また、第 1 と第 2 の防水部よりなる防水部材 6 を歯車カバー基台 14 に一体に形成することが好ましい。このように、防水部材 6 と歯車カバー基台 14 とを一体化することで部材点数を削減することができ、また、歯車カバー基台 14 を組み込むことで同時に防水部材 6 の組み込みができるものである。

【0053】また、駆動源であるモータ 3 を内蔵した基台を本体ケーシング 1 に内装するとともに本体ケーシング 1 と基台 8 の上部外周との間に第 2 の防水部材 23 を介装し、基台の上部に設けた孔にモータ 3 により回転される回転軸 45 を挿通して外部に突出させ、該基台 8 の上部に設けた孔の内周面部と回転軸 45 の外周部との間に防水部材 6 を介装することが好ましい。このような構

成とすることで、第2の防水部材23により本体ケーシング1と基台8の上部外周との間の防水ができ、また、防水部材6により基台の孔から突出する回転軸45の防水ができ、これにより基台に内蔵したモータ3を回転シリンダー4側に対して確実に封水することができるものである。そして、第2の防水部材23を設けることで、基台へのモータ3の内蔵に当たり、水封等を考慮する必要がなく、基台8へのモータ3の組み込みの構造を簡略化できるものである。

【0054】また、回転軸45の上端部に係合部を設け、脱毛ヘッド2に設けた歯車列の始端の歯車48に回転軸45を抜き差し自在にはめ込むための嵌め込み穴を形成すると共に嵌め込み穴に係合部45aに着脱自在に係合する被係合部48aを設けることが好ましい。このような構成とすることで、脱毛ヘッド2を簡単に着脱でき、また、脱毛ヘッド2を取付けた状態では係合部45aが被係合部48aに係合することで、確実に回転軸45の回転を脱毛ヘッド2に設けた歯車列の始端の歯車48に伝達することができるものである。

【0055】

【発明の実施の形態】以下、本発明を添付図面に示す実施形態に基づいて説明する。

【0056】本発明の脱毛装置は手で把持できる本体ケーシング1に毛を除毛するための脱毛手段を有する脱毛ヘッド2を備えたものであり、本体ケーシング1には駆動源であるモータ3が内蔵してあり、脱毛ヘッド2には脱毛手段を備えた回転シリンダー4が取付けてある。回転シリンダー4に設けた脱毛手段は開閉して毛を掴む複数の爪5を備えていて回転により毛を挟持して引き抜くように構成してあり、モータ3の回転を駆動伝達手段により回転シリンダー4に伝達して回転シリンダー4を回転することで、脱毛手段により毛を挟持して引き抜くようになっている。そして、本発明においては、駆動源であるモータ3から回転シリンダー4に駆動伝達するための駆動伝達手段である歯車列の途中にモータ3側を回転シリンダー4側に対して封水するための防水部材6を設け、モータ3側に毛や皮脂や水が入らないような構造、特に、モータ3側に水が入らないような防水構造とすることで水洗いが可能なようにしたものである。

【0057】まず、図1乃至図10に基づいて本発明の一実施形態につき説明する。図1、図3、図4、図5に示すように、本体ケーシング1は前後に2つ割した半割ケーシング7を合着して構成してあり、本体ケーシング1は上端が開口したもので、モータ3や駆動伝達手段である歯車列を内蔵した基台8が本体ケーシング1内に内装してあり、さらに、本体ケーシング1内にモータ3を駆動するための乾電池又は充電器9を内装してある。

【0058】基台8の上面部は本体ケーシング1の上端開口を塞いでおり、この基台8の上面部にフック取付け部10が設けてあり、脱毛ヘッド2の下面部に設けた一

対のフック11をフック取付け部10に着脱自在に取付けることで本体ケーシング1に対して脱毛ヘッド2を着脱自在に取付けることができるようにしている。

【0059】基台8は複数の分割された基台を組み合わせで構成してあり、本実施形態においては、基台8がモータ3を内装するモータ内装用基台12と、モータ3をカバーするためのモータカバー用基台13と、モータカバー用基台13の外側方において歯車列をカバーするための歯車カバー基台14と、モータ内装用基台12とモータカバー用基台13と歯車カバー基台14との上部を覆う上基台15とで構成してある。

【0060】モータ内装用基台12は図5に示すように、コ字状をしたモータ内装部12aと、モータ内装部12aの上面部の一端部から上方に突出した上向き突片12bとで構成してあり、上向き突片12bに係止部12cが設けてある。コ字状をしたモータ内装部12aには側方の開口からモータ3が嵌め込まれて内装され、コ字状をしたモータ内装部12aの側方開口部にモータカバー用基台13を取付け、更に、モータカバー用基台13の外側に歯車カバー基台14を取付けてあり、モータカバー用基台13と歯車カバー基台14とに囲まれた空所が歯車列内装部16となっており、モータ内装部12aと歯車列内装部16とがモータカバー用基台13により仕切ってある。

【0061】モータ内装部12aに内装されたモータ3の出力軸3aが仕切りであるモータカバー用基台13の孔13aを貫挿して歯車列内装部16内に突出しており、この出力軸3aの歯車列内装部16内に突出した部分にピニオン17が固着してある。モータ内装部12a内には複数の減速歯車18、19が設けてある。減速歯車18、19はいずれも大歯車18a、19aと小歯車18b、19bとよりなるもので、各減速歯車18、19の軸18c、19cの両端部がそれぞれモータカバー用基台13と歯車カバー用基台14に設けた孔に軸支してある。減速歯車18の大歯車18aがピニオン17に噛み合っており、減速歯車18の上方に減速歯車19が配置してあり、減速歯車18の小歯車18bに減速歯車19の大歯車19aが噛み合っている。減速歯車19の大歯車19aと小歯車19bとの間には小歯車19bと同径かまたは大径のボス19dが設けてある。

【0062】モータカバー用基台13の外面部（つまり歯車カバー基台14側の面）の両側端及び下端部にわたってU字状にリブ13bが突設してあり、このU字状をしたリブ13bの両側上部には段部13cが設けてある。

【0063】図7に示すように、歯車カバー基台14の内面部（つまりモータカバー用基台13側の面）は凹所となっており、歯車カバー基台14の凹所の上部に凹所を上凹所14dと下凹所14eとに上下に仕切るように横向きに突出壁14aを設けてあり、この突出壁14a

の先端部に立ち上がり部 14 b を形成してあり、立ち上がり部 14 b の中央部に半円状に凹設した下半円状嵌め込み部 14 c を形成してあり、下半円状嵌め込み部 14 b の略下半分が突出壁 14 a の先端面よりも下方に位置して図 7 に示すように下半円状嵌め込み部 14 b の略下半分の部分において突出壁 14 a の先端面が露出している。また、下半円状嵌め込み部 14 b の略下半分を除く立ち上がり部 14 b の他の部分は突出壁 14 a の上面よりも上方に突出している。上凹所 14 d の両側壁 14 g は下凹所 14 e の両側壁よりもモータカバー用基台 13 側に向けて突出しているが、立ち上がり部 14 b は上凹所 14 d の両側壁 14 g よりも更にモータカバー用基台 13 側に突出している。そして、この立ち上がり部 14 b を突出した部分をモータカバー用基台 13 の段部 13 c にはめ込むとともに U 字状のリップ 13 b の段部 13 c よりも下の部位に下凹所 14 e の外周縁面を当接するようになっている。また、上凹所 14 e の立ち上がり部 14 b と反対側の側壁部の内面には位置決め凹部 14 f が形成してある。

【0064】上基台 15 は外形が本体ケーシング 1 の上端開口とほぼ同じ形状をしており、外周部に第 2 の防水部材嵌め込み溝部 15 a が形成してあって、この第 2 の防水部材嵌め込み溝部 15 a にリング状をした弾性を有する第 2 の防水部材 23 の内側半部が嵌め込まれる。図 5 に示すように、上基台 15 の一側部に開口部 15 b が設けてあり、上基台 15 の下面部には開口部 15 b を挟んで外側に固定片 15 c を垂設すると共に内側に垂下壁 15 d を垂設してある。垂下壁 15 d の下端部の中央部には略半円状をした上半円状嵌め込み部 15 e が形成してある。また、上基台 15 の下面部の固定片 15 c を垂下した方の端部の反対側の端部には被係止部 15 f が形成してある。また、上基台 15 の上面部中央部には上方に向けてトンネル通路を有するトンネル用突部 15 g が突設してあり、トンネル用突部 15 g の上面部の中央部には孔 15 h が設けてあり、トンネル用突部 15 g の上面部のトンネル通路と直交する方向の両端部には上方に向けて支持突片 15 i が突設してある。また、開口部 15 b 内には出力用歯車 20 が配置してあって、出力用歯車 20 の軸 20 a が開口部 15 b の両内壁部に軸支してある。

【0065】モータ内装用基台 12 の下端部とモータカバー用基台 13 の下端部と歯車カバー基台 14 の下端部とをそれぞれの下端部に設けた孔に歯車カバー基台 14 側からねじ具 21 を挿入して固着する。また、モータ内装用基台 12 の上端部とモータカバー用基台 13 の上端部と歯車カバー基台 14 の上端部とにわたるように上基台 15 が配置され、モータ内装用基台 12 に設けた係止部 12 c に上基台 15 に設けた被係止部 15 f を係止し、更に、上基台 15 の固定片 15 c を歯車カバー基台 14 の位置決め凹部 14 f に嵌め込んで位置決めした状

態で歯車カバー基台 14 と固定片 15 c とをねじ具 21 により固定する。

【0066】ここで、本発明においては、駆動伝達手段である歯車列の途中に防水部材 6 を設けて上基台 15 の開口部 15 b から入った毛や油脂や水がモータ 3 側に入るのを防止するようになっている。

【0067】防水部材 6 は弾性を有しており、その形状は図 7 に示すようなものであり、減速歯車部分において封水する第 1 の防水部と、分割された基台間の分離継ぎ目を封水する第 2 の防水部とを一体化したものであってゴムのような弾性体により構成してある。第 1 の防水部は歯車に設けたボス又は歯車の軸にはめ込むための環状体 6 a により構成してあり、第 2 の防水部は基台 8 間の分離継ぎ目に沿って帯状に連続して封水するための帯状枠体 6 b により構成してある。帯状枠体 6 b は横向きコ字状をしたコ字状帯部 6 c の両端部から下方に向けて縦帯部 6 d を一体に垂下するとともに縦帯部 6 d の下端から互いに近づく方向に下横帯部 6 e を一体に連設して構成してあり、帯状枠体 6 b の対向する下横帯部 6 e の先端間に環状体 6 a を一体に連設することで防水部材 6 が一体に形成してある。

【0068】しかして、上記の構成の防水部材 6 は、環状体 6 a の孔を減速歯車 19 のボス 19 d に水密的に嵌め込み、コ字状帯部 6 c を歯車カバー基台 14 の上端面である上凹所 14 d の側壁 14 g の上面と上基台 15 の下面部の開口部 15 b の周囲の部分とで上下から押圧挟持し、縦帯部 6 d をモータカバー用基台 13 のリップ 13 b の段部 13 c 部分と歯車カバー基台 14 の上凹所 14 d の側壁 14 g の側端面とで押圧挟持し、下横帯部 6 e を縦帯部 6 d 間に隙間無くぴったりとはめ込んだ上基台 15 の垂下壁 15 d の下端面と立ち上がり部 14 b の上面とで押圧挟持し、環状体 6 a の上半分と下半分とを上半円状嵌め込み部 15 e と下半円状嵌め込み部 14 c に嵌め込んで上下より押圧挟持し、さらに環状体 6 a の下部の側面に突出壁 14 a の先端面を押接してある。このようにして防水部材 5 を取付けるのであるが、図 6 にはこのようにして取付けた防水部材 6 を歯車カバー基台 14、モータカバー用基台 13、上基台 15 の合わせ目部分に介在させた部分の斜視図が示してある。

【0069】このようにして防水部材 6 を取付けることで、垂下壁 15 d と、立ち上がり部 14 b を有する突出壁 14 a と、その間に介在される防水部材 6 とで減速歯車 19 のボス 19 d 部分を境界として歯車列内装部 16 内をモータ 3 側と開口部 15 b 側とに水密的に仕切られることになる。そして、減速歯車 19 の大歯車 19 a が下凹所 14 e と連通した空所に位置し、減速歯車 19 の小歯車 19 b が上凹所 14 d 内に位置して開口部 15 b の直下に位置し、開口部 15 b に配設した出力用歯車 20 と噛み合っている。したがって、開口部 15 b から入った毛や油脂や水は防水部材 6 によりそれ以上内部に入



るのが防止されることになる。

【0070】上記のようにモータ3と歯車列を内蔵した基台8を2つ割りの本体ケーシング1内に内装するには以下のようにして行われる。

【0071】半割ケーシング7の内面部の上部には内面部の横方向にわたって第2の防水部材嵌め込み溝部7aが形成してあり、更に半割ケーシング7の合わせ部分に沿ってU字状に第3の防水部材嵌め込み溝部7bが形成してあり、U字状をした第3の防水部材嵌め込み溝部7bの両上端部が第2の防水部材嵌め込み溝部7aの下端に連通している。前後に対向する半割ケーシング7を合着する際前後に対向する第3の防水部材嵌め込み溝部7aに第3の防水部材22の前側半部と後側半部とを嵌め込んで合せた状態でねじ具により両半割ケーシング7を合着して本体ケーシング1を構成するのであるが、この場合、モータ3と歯車列を内蔵した基台を内部に配置し、上基台15の外周部に取付けている第2の防水部材23の外側半部を両半割ケーシング7の第2の防水部材嵌め込み溝部7aに嵌め込み、U状をした第3の防水部材22の両上端部をそれぞれ第2の防水部材23の下端面に押接してあって第3の防水部材22と第2の防水部材23とで半割ケーシング7の合着部分及び本体ケーシング1の内面部と上基台15の外周面部との間の封水を連続して行っている。

【0072】このような構成とすることで、基台を内蔵した本体1内には上基台15に設けた開口部15b以外には内部に連通する部分は無く、しかも基台8内において開口部15bの近傍で防水部材6によりそれ以上モータ3側に毛や皮脂や水等が入らないようになっている。

【0073】ここで、基台は上記のように上基台15の外周部分を弾性を有する第2の防水部材23により本体ケーシング1に弾性的に支持してあるが、基台（モータ内装用基台12）の下面部は更に半割ケーシング7内に設けたばね支持部7cに支持したばね材24により弾性的に支持してあり、また、半割ケーシング7内の第2の防水部材嵌め込み溝部15aよりも下方に設けた突起7dにコ字状をした支持棒25の孔25aが嵌め込むことで支持棒25を一方の半割ケーシング7の内部に取付けてあり、コ字状の支持棒25の両側片にU字状をした切り込み溝部を形成して切り込み溝部に囲まれた部分に弾性を有する連結片25bが形成してあり、この連結片25に設けた孔を歯車カバー基台14とモータ内装用基台12の外面にそれぞれ設けた取付け突起14hに嵌め込んで取付けてあり、これにより第2の防水部材23とばね材24との間で更に基台8を本体ケーシング1に対して弾性的支持してある。これによりモータ3を内蔵した基台8が弾性を有する第2の防水部材23とばね24と弾性片25bを有する支持棒25により弾性的に支持してあって、モータ3の振動が本体ケーシング1側に伝わりにくくしてある。

【0074】上基台15の上面部の両側にはスライド自在にスライド棒26が配置してあり、平面視略矩形をしたスライド棒26の外側片部から外側方に向けて操作部26aが突設してあり、スライド棒26の内側片部の内面に支持フック26bが突設してあり、更にスライド棒26の内側片部の上面にストッパ用突部26cが上方に向けて突出してある。

【0075】図1に示すように、両スライド棒26の内側部分をトンネル用突部15gのトンネル通路内にスライド自在に嵌め込み、ストッパ用突部26cをトンネル用突部15gの上面部に設けた孔15h内にスライド自在に嵌め込んであって、ストッパ用突部26cが孔15hの縁に当たることによってスライド棒26が抜けなくなっている。トンネル用突部15gのトンネル通路内において両スライド棒26間にスプリング26dが介装してあって、スプリング26dにより両スライド棒26を外側に向けて弾性付勢している。そして、トンネル用突部26cと両スライド棒26とでフック取付け部が構成してある。また、両スライド棒26の操作部26aは本体ケーシング1に設けた孔7eにはめ込まれて本体ケーシング1より外側方に突出させてある。

【0076】脱毛ヘッド2は図1、図2、図8に示すように、脱毛手段を備えた回転シリンダー4と、シリンダー取付け基台27と、シリンダーカバー28と、カム29と、保持ばね30と、ヘッドフレーム31とで構成してある。

【0077】回転シリンダー4は図9に示すように、円周方向に複数箇所（実施形態では36°の間隔を置いて10箇所）の凹部4aが形成してある。凹部4aの両端部にはそれぞれ固定爪5bが突出してあり、この凹部4aの両端部に突設した固定爪5bには孔5b1が形成してある。また、凹部4a内には脱毛用主体ユニット32が嵌め込んである。

【0078】脱毛用主体ユニット32は図9に示すように支点板33と、複数（実施形態では4枚）の可動爪5aと、支点止め部材34と、ばね受け部材35と、伝達レバー36と、ばね37とで構成してある。支点板33は中央部にばね受け嵌め込み用角孔33aを設け、両側にリブ嵌め込み用角孔33bを設け、ばね受け嵌め込み用角孔33aと両リブ嵌め込み用角孔33bとの間と、両リブ嵌め込み用角孔33bの角外方にそれぞれ可動爪嵌め込み用角孔33cが形成してある。

【0079】支点止め部材34は中央部にはね受け嵌め込み孔34aが設けてあり、ばね受け嵌め込み孔34aの両側から上方に固定爪5bが突設してあり、また、支点止め部材34の下面部の両側にはそれぞれ2個で一組となったリブ34bが下方に向けて垂設してあり、リブ34bには長孔34cが設けてある。また、支点止め部材34には長手方向に孔34dが設けてある。そして、この支点止め部材34は両側の2個で一組みとなったリ

ブ 3 4 b を支点板 3 3 の両側のリブ嵌め込み用角孔 3 3 c に嵌め込んである。

【0080】ばね受け部材 3 5 には上部に孔 3 5 a が設けてあり、また、下部にばね挿入孔 3 5 b が設けてある。そして、ばね受け部材 3 5 が支点止め部材 3 4 のばね受け嵌め込み孔 3 4 a、支点板 3 3 のばね受け嵌め込み用角孔 3 3 a に嵌め込んである。また、可動爪 5 a には孔 5 a 1 が設けてあり、4 枚の可動爪 5 a のうち 2 枚の可動爪 5 a が支点止め部材 3 4 に突設した固定爪 5 b とばね受け部材 3 5 との間からばね受け嵌め込み孔 3 4 b に挿入して、更に、支点板 3 3 のばね受け嵌め込み用角孔 3 3 a の両側の可動爪嵌め込み用角孔 3 3 b に挿入してある。また、他の 2 枚の可動爪 5 a は支点板 3 3 の両端部の可動爪嵌め込み用角孔 3 3 b に嵌め込んである。また、2 個で一組となったリブ 3 4 b にはそれぞれ伝達レバー 3 6 の上部の突片 3 6 a が嵌め込んであって突片 3 6 a に設けた係合突部 3 6 b がリブ 3 4 b の長孔 3 4 c にスライド自在に係合してあって、一方の伝達レバー 3 6 が一侧の 2 枚の可動爪 5 a の下部間に介在され、他方の伝達レバー 3 6 が他側の 2 枚の可動爪 5 a の下部間に介在してある。また、ばね受け部材 3 5 に設けたばね挿入孔 3 5 b に挿入したばね 3 7 が中央部の両可動爪 5 b の下部内面に弾接している。

【0081】上記のようにして脱毛用主体ユニット 3 2 が一つのユニットとして組み立ててある。そして、この脱毛用主体ユニット 3 2 を回転シリンダー 4 の各凹部 4 a に嵌め込み、凹部 4 a の一方の端に設けた固定爪 5 b に設けた孔 5 b 1 から軸 4 9 を挿入し、支点止め部材 3 4 の孔 3 4 d、4 枚の可動爪 5 a の各孔 3 a 1、ばね受け部材 3 5 の孔 3 5 a を挿通し、該軸 4 9 の先端部を凹部 4 a の他端の固定爪 5 b の孔 5 b 1 に嵌め込んで凹部 4 a に脱毛用主体ユニット 3 2 を取付けてある。

【0082】回転シリンダー 4 の軸方向の両端面部には図 9 に示すように周方向に複数の孔 4 b が形成してあり、回転シリンダー 4 の軸方向の一端端面部に設けた複数の孔 4 b に周方向に開閉レバー 3 8 と開閉レバー 3 9 とが交互に挿入してあり、開閉レバー 3 8 の端部の押圧部 3 8 a は開閉レバー 3 9 の端部の押圧部 3 9 a よりも回転シリンダー 4 の径方向の内側にずれて位置しており、図 8 に示すように径方向にずれている押圧部 3 8 a、3 9 a とが周方向において押圧部 3 8 a の両端部がそれぞれ押圧部 3 9 a の端部と重なっている。

【0083】また、回転シリンダー 4 の軸方向の他端面部に設けた複数の孔 4 b に周方向に開閉レバー 3 9 と開閉レバー 3 8 とが前述と同様にして交互に挿入してある。そして、一端面側の孔 4 b に挿入した開閉レバーとこの孔 4 b と対向する他端面側の孔 4 b に挿入した開閉レバーとは一方側が開閉レバー 3 8 となっていて、他方側が開閉レバー 3 9 となるような関係となっている。

【0084】添付図面に示す実施形態においては、回転

シリンダー 4 の凹部 4 a が軸方向において交互にずれて形成してあるため、開閉レバー 3 9 は開閉レバー 3 8 よりも長さが短くなっている。両側の開閉レバー 3 8、3 9 の端部はそれぞれ凹部 4 a にはめ込んだ脱毛用主体ユニット 3 2 の両伝達レバー 3 6 の外側端部に接している。そして、開閉レバー 3 9 を外側から押す力が作用しない状態では、ばね 3 7 のばね力により中央の 2 つの可動爪 5 a の下部が外側に押され、これにより両伝達レバー 3 6 が外側に押され、これにより外側の 2 つの可動爪 5 a の下部がそれぞれ外側に押される。このように、中央の 2 つの可動爪 5 a の下部が外側に押されることで該中央の 2 つの可動爪 5 a が支点板 3 3 の可動爪嵌め込み用角孔 3 3 c の孔縁を支点として回転して支点止め部材 3 5 に設けた固定爪 5 b から離れ、また、両外側の可動爪 5 a の下部が外側が押されることで両側の 2 つの可動爪 5 a が支点板 3 3 の可動爪嵌め込み用角孔 3 3 c の孔縁を支点として回転して回転シリンダー 4 に設けた固定爪 5 b から離れるようになっている。

【0085】回転シリンダー 4 には軸 4 b が挿入してあり、シリンダー取付け基台 2 7 の一端部の上面部から上方に向けて突出した突出支持部 2 7 a とシリンダー取付け基台 2 7 の他端部に取付けられるシリンダーカバー 2 8 に設けた突出支持部 2 8 a にそれぞれ設けた軸孔部 2 8 b に上記シリンダー 4 の軸 4 b の両端部が軸支してある。

【0086】図 8 に示すように、突出支持部 2 7 a、2 8 a にはそれぞれ角孔状をしたカム挿入孔 2 7 c、2 8 c が形成してあり、カム挿入孔 2 7 c、2 8 c の上下縁部に軸支持溝 2 7 d、2 8 d が形成してある。そして、カム 2 9 を構成するローラがそれぞれカム挿入孔 2 7 c、2 8 c に嵌め込まれ、各ローラに挿入したローラ軸 2 9 a の上下両端部が軸支持溝 2 7 d、2 8 d に嵌め込み支持してあり、ローラは水平回転をするようになっている。ここでローラの一部はカム挿入孔 2 7 c、2 8 c から内側に突出している。

【0087】突出支持部 2 7 a、突出支持部 2 8 a の外側下部には保持ばね嵌め込み溝部 2 7 e、2 8 e が設けてあり、保持ばね嵌め込み溝部 2 7 e、2 8 e にそれぞれ保持ばね 3 0 の U 字状をした下部が嵌め込んで支持してあり、U 字状部分に設けた係止突片部 3 0 a が保持ばね嵌め込み溝部 2 7 e、2 8 e に設けた係止孔部 2 7 f、2 8 f に係止して取付けてある。保持ばね 3 0 の上部には孔部 3 0 b が形成してあり、この孔部 3 0 b の上下縁部によりローラ軸 2 9 a の上下両端部を弾性的に押圧しており、孔部 3 0 b を設けることでローラがこの孔部 3 0 b に対応して保持ばね 3 0 に接触しないようになっている。

【0088】シリンダー取付け基台 2 7 の下面部には回転シリンダー 4 の軸 4 b と平行な方向の両側にそれぞれ対向するように一対のフック 1 1 が下方に向けて突出し

ており、シリンダー取付け基台 27 の回転シリンダー 4 の軸 4 b と直交する方向の両側部には嵌め込み凹部 27 h が形成してある。また、シリンダー取付け基台 27 の突出支持部 27 a を突出した方と反対側の端部には凹欠部 27 i が設けてあり、この凹欠部 27 i 内に駆動用歯車 40 が配置してあり、この駆動用歯車 40 の軸の両端部がシリンダー取付け基台 27 とシリンダーカバー 28 とに軸支してあり、駆動用歯車 40 の上部は回転シリンダー 4 に設けた歯車 41 に噛み合っている。シリンダー取付け基台 27 とシリンダーカバー 28 とを回転シリンダー 4 を取付けた状態で組み合わせて固着し、この状態でヘッドフレーム 31 を被せて取付けることで脱毛ヘッド 2 を構成してある。

【0089】上記の構成の脱毛ヘッド 2 は本体ケーシング 1 に対して着脱自在に取付けられるものである。脱毛ヘッド 2 の取付けに当たっては、操作部 26 a を押した状態で脱毛ヘッド 2 の下面の一对のフック 11 をそれぞれ両スライド枠 26 の矩形状をした開口内に嵌め込み、この状態で操作部 26 a の押圧を解除することでスプリング 26 d のばね力により両スライド枠 26 を外側に移動させて支持フック 26 b を上記フック 11 に係止することで取付けるものである。この場合、トンネル用突部 15 g に突設した一对の支持突片 15 i がシリンダー取付け基台 27 の嵌め込み凹部 27 h に嵌め込んであって脱毛ヘッド 2 が本体ケーシング 1 にがたつくことなく確実に取付けられるようになっている。このように脱毛ヘッド 2 を本体ケーシング 1 に対して取付けた状態では駆動用歯車 40 と出力用歯車 20 とが噛み合うことになり、したがって、モータ 3 の回転を歯車列を介して回転シリンダー 4 に設けた歯車 41 に伝達して回転シリンダー 4 を回転するようになっている。

【0090】一方、脱毛ヘッド 2 を取り外すに当たっては、上記と逆に操作部 26 a を押すことで支持フック 26 b をフック 11 から外すことができるので、この状態で脱毛ヘッド 2 を引き離すことで取り外すことができるものである。

【0091】しかして、脱毛ヘッド 2 を本体ケーシング 1 に取付けた状態で人体の毛を脱毛するものであるが、脱毛は以下のようにして行われる。

【0092】すなわち、モータ 3 を回転することで、ギア列を介して回転シリンダー 4 を回転する。回転シリンダー 4 が回転して、開閉レバー 38、39 の押圧部 38 a、39 a がカム 29 を構成するローラに当たる位置に来到すると、ローラにより開閉レバー 38、39 をばね 37 に抗して内側に押し、開閉レバー 38、39 の先端部により外側の可動爪 5 a の下部を内側に押すと共に該外側の可動爪 5 a の下部を介して伝達レバー 36 を内側に押し移動させて内側の可動爪 5 a の下部を内側に押す。このようにして 4 枚の可動爪 5 a の下部が内側に押されることで可動爪 5 a が回転して可動爪 5 a の上部がそれ

ぞれ固定爪 5 b に押し当たることになり、可動爪 5 a と固定爪 5 b との間に導入された毛が挟持されることになる。そして、この毛を挟持した状態で回転シリンダー 4 が回転することで毛を引き抜くものである。回転シリンダー 4 の回転により次の開閉レバー 38、39 がローラの所に至ってローラにより押圧されて上記と同様に毛を挟持して引き抜くものである。

【0093】ここで、図 8 に示すように、周方向に一つ置きに設けた開閉レバー 38 の押圧部 38 a の両端部が開閉レバー 39 の押圧部 39 a の端部と周方向においては重なっているため、毛を挟持するのに寄与した開閉レバーの押圧部の回転方向の後端部をローラで押圧しているとき、次の開閉レバーの押圧部の前端部がローラで同時に押圧されることになり、このため、爪 5 を回転シリンダー 4 の周方向に複数配置しても毛を挟持して引き抜く距離を長くとることができるものである。

【0094】上記のようにして脱毛するのであるが、毛や皮脂は駆動伝達手段を構成する歯車列の途中に設けた防水部材 6 の存在によりモータ 3 側に侵入するのが防止されるようになっている。

【0095】脱毛装置の掃除に当たっては、上記のように防水部材 6 をギア列の途中に設けて防水部材 6 を設けた部分よりもモータ 3 側には毛や皮脂等が侵入しないので、防水部材 6 よりも回転シリンダー 4 側を掃除すればよくて、掃除が簡単に行えるものである。また、モータ 3 側に水が入るのが防水部材 6 により防止されるので、水洗いにより掃除することが可能となり、水洗いにより簡単且つ確実に毛や皮脂を洗い落とすことができるものであり、この場合、ブラシを使いながら水洗いするとより爪 5 や歯車に巻き付いたり付着した毛や皮脂を容易に掃除できるものである。

【0096】そして、上記の実施形態のように本体ケーシング 1 に対して回転シリンダー 4 を備えた脱毛ヘッド 2 を着脱自在に取付けた構成とすることで、掃除に当たって図 10 に示すように、脱毛ヘッド 2 を本体ケーシング 1 から外して掃除することで、隅々まで容易に掃除でき、特に、水洗いに当たってモータ 3 から分離された脱毛ヘッド 2 のみを重点的に水洗いできて、回転シリンダー 4、爪 5 等に巻き付いたり付着したりしている毛や皮脂を綺麗に水洗いすることが可能となるものである。

【0097】ここで、すでに述べたように、脱毛ヘッド 2 の下面部に駆動用歯車 40 を露出させてあるが、脱毛ヘッド 2 の下面に設けたフック 11 を駆動用歯車 40 の露出位置よりも突出させてあるので、上記のように掃除などのために脱毛ヘッド 2 を外した場合、駆動用歯車 40 がフック 11 よりも内側に位置することになって、駆動用歯車 40 が他の物に当たって破損したりするのを防止することができるものである。

【0098】また、本体ケーシング 1 の上開口を遮蔽して本体ケーシング 1 の上面部を構成する上基台 15 の開

口部 15b において出力用歯車 20 を露出させた構成としてあるが、上基台 15 の上面部に設けたフック取付け部を出力用歯車 20 の露出位置よりも突出させてあるので、脱毛ヘッド 2 を外した場合、出力用歯車 20 がフック取付け部よりも内側に位置することになって、出力用歯車 20 が他の物に当たって破損したりするのを防止することができるものである。

【0099】ところで、すでに述べたように、本体ケーシング 1 の孔 7e からフック取付け部の構成部材の一つであるスライド枠 26 の操作部 26a を突出させてあるが、操作部 26a を突出させる孔 7e が第 2 の防水部材 6 による封水位置よりも本体ケーシング 1 の上端開口寄りにずれた位置に形成してあることで、操作部 26a を突出させる孔 7e から本体ケーシング 1 内に毛や皮脂や水が入っても、この毛や皮脂や水が本体ケーシング 1 のモータ 3 を内装した部分には入らないものである。

【0100】また、モータ 3 や歯車列の組み込みが容易なように基台を複数の基台に分割し、この複数の基台を係止手段により係止すると共にねじ具 21 により固着しているが、係止手段による係止位置や固着具 21 による固着位置はいずれも第 2 の防水部材 23 による封水位置よりも本体ケーシング 1 内に位置させてあるので、係止や固着部分からの毛や皮脂や水の侵入防止を考慮する必要がないものであり、これにより分割された基台 8 の組立固着の構造が容易となるものである。

【0101】次に、他の実施形態につき図 12、図 13 に基づいて説明する。図 7、図 8 に示す実施形態では、下半円状嵌め込み部 14b の略下半分を突出壁 14a の先端面よりも下方に位置させて下半円状嵌め込み部 14b の略下半分の部分において突出壁 14a の先端面を露出させ、防水部材 6 の環状体 6a の下面を立ち上がり部 14b に設けた下半円状嵌め込み部 14b の上面に押し当てるとともに環状体 6a の上面に垂下壁 15d の上半円状嵌め込み部 15e の下面を押し当て、更に、突出壁 14a の先端面のした下半円状嵌め込み部 14b に露出した部分を環状体 6a の側面を押し当てるようにして、環状体 6a を上下及び側方から押圧支持して位置保持及び封水を行っている実施形態を示しているが、図 12、図 13 に示すように、下半円状嵌め込み部 14b の全部を突出壁部 14a よりも上に位置させて、防水部材 6 の環状体 6a の下面を立ち上がり部 14b に設けた下半円状嵌め込み部 14b の上面に押し当てるとともに環状体 6a の上面に垂下壁 15d の上半円状嵌め込み部 15e の下面を押し当てることで環状体 6a を上下押圧支持して位置保持及び封水を行ってもよいものである。

【0102】また、上記図 12 に示す実施形態においては第 2 の減速歯車である減速歯車 19 が軸 19c の両側に隙間を介して径の異なる 2 つの歯車を固着し（つまり大歯車 19a と小歯車 19b とを隙間を介してそれぞれ固着し）、防水部材 6 の環状体 6a を減速歯車 19 の軸

19c の大歯車 19a と小歯車 19b との間の部分に水密的に嵌め込んである。この実施形態においては、図 12 に示すように大歯車 19a と小歯車 19b とボス 19d を一体に形成した複雑な構造の歯車を使用する必要がなく、簡単な形状の大歯車 19a と簡単な形状の小歯車 19b を用いることができるものである。

【0103】ところで、上記各実施形態では弾性を有する防水部材 6 を基台とは別体に形成した例を示したが、図 11 に示すように、防水部材 6 を基台と一体化したものであってもよい。図 11 に示す実施形態においては歯車カバー基台 14 の上端部に防水部材 6 を一体に形成してある。ここで、一体化するに当たっては防水部材 6 を基台 8 である歯車カバー基台 14 に接着したものでもよく、あるいは、2 色成形により一体成形してもよいものである。

【0104】次に、図 14、図 15 に基づいて本発明の更に他の実施形態に基づいて説明する。本実施形態においては、基台がモータ 3 を内装するモータ内装用基台 12 と、モータ 3 をカバーするためのモータカバー用基台 13 と、モータカバー用基台 13 の外側方において歯車列をカバーするための歯車カバー基台 14 とで構成してあり、上記 3 つの基台 8 をねじ具 21 により連結固着してある。モータ内装用基台 12 のモータカバー用基台 13 の取付け側と反対側の上部から上方に突出支持部 12d を突出してあり、また、歯車カバー基台 14 の上部から上方に突出支持部 14i が突出してあり、基台に設けた両突出支持部 12d、14i とで回転シリンダー 4 の軸 4b の両端部を軸支してある。本実施形態においては、モータ 3、歯車列、回転シリンダー 4 を基台に簡単に組み込んで内装することができるようになっている。

【0105】この図 14 に示す実施形態においては、モータカバー用基台 13 に仕切り用突壁 13e を設け、この仕切り用突壁 13e から上方に向けて立設した縦仕切り部 13d と、歯車カバー基台 14 から下方に向けて垂設した縦仕切り部 14j と、両縦仕切り部 13d、14j の先端間に介在された防水部材 6 により縦仕切りが構成され、この縦仕切りにより歯車列を内装した空所を仕切ってモータ収納用基台 12 の上部の他端部と縦仕切りとに囲まれた部分を開口部 42 としてある。仕切りの中央部に位置する防水部材 6 に設けた環状体 6a を水密的に軸 43 が貫通しており、この軸 43 の両端部が歯車カバー基台 14 とモータ内装用基台 12 とに軸支してある。また、軸 43 の片側半部は上記開口部 42 内を横切るように架設された状態となっている。軸 43 には縦仕切りを介して両側にそれぞれ歯車を固着してある。ここで、モータ 3 側に位置する歯車がモータからの回転が伝達される入力側歯車 44 となっており、開口部 42 内に位置している歯車が出力用歯車 20 となっている。

【0106】出力用歯車 20 は回転シリンダー 4 に設けた歯車 41 に噛み合っている。したがって、本実施形態

においては出力歯車 20 がモータ 3 の回転を回転シリンダー 4 に設けた歯車 41 に伝達するための歯車列のうちの最終段歯車となるものであり、この最終段歯車の軸部分において防水部材 6 により封水してあるので、掃除に当たっては回転シリンダー 4 と歯車列の内の最終段歯車のみを掃除するだけでよくて歯車列の他の歯車を掃除する必要がなく、掃除が簡単に行え、また、水洗いで簡単に毛や皮脂などを洗い落とすことができるものである。

【0107】本実施形態においては回転シリンダー 4 が本体ケーシング 1 に対して着脱自在となっていないが、前述の実施形態と同様に回転シリンダー 4 を備えた脱毛ヘッド 2 を本体ケーシング 1 に対して着脱自在としてもよく、この場合においても歯車列の最終歯車の軸又はボス部分で防水部材 6 により防水するようにしてもよいものである。この場合には、着脱自在な脱毛ヘッド 2 側においては回転シリンダー 4 に設けた歯車 41 以外には歯車がなく、脱毛ヘッド 2 を取り外して掃除するのが簡単となるものである。

【0108】また、本実施形態でも防水部材 6 を分割した基台 8 の一つと一体形成したものであってもよいものである。

【0109】次に、図 16 乃至図 18 に基づいて本発明の更に他の実施形態につき説明する。本実施形態においては、駆動源であるモータ 3 を内装したモータ内装用基台 12 の上部に上基台 15 を固着して基台 8 が構成してあり、このモータ 3 を内蔵した基台 8 を本体ケーシング 1 に内装するとともに本体ケーシング 1 と上基台 15 の上部外周との間に第 2 の防水部材 23 を介装してある。上基台 15 の上部に設けた孔 15j にモータ 3 の出力軸 3a に嵌め込み固着された回転軸 45 を挿通してあり、この回転軸 45 の上端部が上基台 15 の上面部に設けたトンネル用突部 15g の上面部に設けた孔を通して上方外部に突出している。上基台 15 の孔 15j の内周面部と回転軸 45 の外周部との間には防水部材 6 が介装してある。これにより、モータ 3 を内蔵せる基台を内装した本体ケーシング 1 の上開口が上基台 15 により蓋されるとともに防水部材 6 及び第 2 防水部材 23 により内部に毛や皮脂や水が入らない構造となっている。回転軸 45 の上部には係合部 45a が形成してある。

【0110】上基台 15 の上部にはすでに述べた実施形態と同様にフック取付け部 10 が設けてある。脱毛ヘッド 2 は脱毛手段を備えた回転シリンダー 4 と、シリンダー取付け基台 27 と、ヘッド側下基台 46 と、シリンダーカバー 28 と、カム 29 と、保持ばね 30 と、ヘッドフレーム 31 とで構成してある。

【0111】ヘッドフレーム 31 内にシリンダー取付け基台 27 とシリンダーカバー 28 を配設し、更にシリンダー取付け基台 27 の下面部とシリンダーカバー 28 の下面部とにわたってヘッド下基台 46 を配設し、これらの部材をねじ具 21 により連結固着してある。脱毛手段、

回転シリンダー 4、保持ばね 30 等の構造は前述のものと同一であるので説明は省略する。脱毛ヘッド 2 内には歯車列が内装してあり、該歯車列の最終の歯車 47 が回転シリンダー 4 に設けた歯車 41 に噛み合っている。ヘッド側下基台 46 の中央部には開口部が形成してあり、この開口部に上記歯車列の始端の歯車 48 が配設してあり、始端の歯車 48 と終端の歯車 47 との間に、始端の歯車 48 に噛み合う歯車部 50a を外周面部に有し且つ上面部にフェイス歯車部 50b を有する歯車 50 と、歯車 50 のフェイス歯車部 50b と終端の歯車 47 とが噛み合っている。始端の歯車 48 には下面部に上記回転軸 45 の係合部 45a と係合自在な被係合部 48a が設けてある。また、ヘッド側下基台 46 の下面部にはフック 11 が下方に向けて突出してある。

【0112】しかして、本実施形態においては、前述の実施形態と同様にしてフック 11 をフック取付け部 10 に着脱自在に取付けることで、脱毛ヘッド 2 を本体ケーシング 1 に取付けるものであり、この場合、回転軸 45 の係合部 45a に脱毛ヘッド 2 に設けた歯車列の始端の歯車 48 の被係合部 48a に係合される。したがって、モータ 3 の回転が回転軸 45、脱毛ヘッド 2 に内装したギア列を介して回転シリンダー 4 を回転して回転シリンダー 4 に設けた爪 5 により毛を挟持して引き抜くものである。この場合、防水部材 6 により毛や皮脂が本体ケーシング 1 内に入らないようになっている。

【0113】掃除に当たっては、脱毛ヘッド 2 を本体ケーシング 1 に取付けたまま、掃除してもよく、また、脱毛ヘッド 2 を本体ケーシング 1 に取付けたまま水洗いにより掃除してもよく、この場合には防水部材 6 により水が本体ケーシング 1 内に浸入するのが防止され、モータ 3 側に水が浸入するのを防止しながら水洗いができることになる。また、フック 11 とフック取付け部 10 の係止を解除することで脱毛ヘッド 2 を本体ケーシング 1 から取り外し、この状態で脱毛ヘッド 2 側と、本体ケーシング 1 側とをそれぞれ掃除することができ、脱毛ヘッド 2 の下面側、本体ケーシング 1 の上面側をそれぞれ露出させて掃除することができるものである。もちろん、脱毛ヘッド 2 と本体ケーシング 1 を分離して水洗いすることで、より綺麗に水洗いすることができるものである。

【0114】

【発明の効果】上記のように本発明の請求項 1 記載の発明にあっては、手で持つことができるような把持部を有する本体ケーシングと、開閉して毛を掴む複数の爪を備えて、回転により毛を引き抜くための脱毛手段を有する回転シリンダーと、回転シリンダーを回転するための駆動源とを備えたものにおいて、駆動源から回転シリンダーに駆動伝達するための駆動伝達手段の途中に駆動源側を回転シリンダー側に対して封水するための防水部材を設けてあるので、防水部材によって体毛や皮脂が駆動源

側に入らないようにでき、この結果、毛や皮脂の掃除が簡単にでき、また、水洗いしてもモータ側に水が浸入しないので水洗いが可能で、ブラシだけでは掃除しにくいところでも水洗いにより容易に除去することができて、簡単に脱毛装置を清潔な状態とすることができるものである。

【0115】また、請求項2記載の発明にあつては、上記請求項1記載の発明の効果に加えて、駆動伝達手段が回転シリンダーに設けた歯車に駆動源からの駆動を伝達するための歯車列により構成され、歯車列に防水部材を設けてあるので、従来のベルトにより駆動を伝達するものに比べて、歯車列により駆動を伝達するので、回転シリンダーに設けた歯車に駆動を伝達する歯車列部分に防水部材を設けて防水するという簡単な構成で防水することができて構造が簡略化するものである。

【0116】また、請求項3記載の発明にあつては、上記請求項2記載の発明の効果に加えて、防水部材が、大歯車と小歯車とからなる減速歯車部分において封水しているので、減速歯車を大歯車と小歯車とで構成することで、コンパクト化が図れ、また、減速歯車の大歯車と小歯車との間に防水部材を介在させることで、簡単な構成で歯車列の途中において防水することができるものである。

【0117】また、請求項4記載の発明にあつては、上記請求項2記載の発明の効果に加えて、防水部材が、減速歯車部分において封水する第1の防水部と、歯車の軸を軸支する基台間の分離継ぎ目を封水する第2の防水部とを一体化したので、歯車列の途中において駆動源側を回転シリンダー側に対して封水するに当たり、単一の防水部材により減速歯車部分だけでなく歯車の軸を軸支する基台間の分離継ぎ目部分も封水することができ、部品点数が少なくなつて安価な防水構造とすることができ、また、部材の組み立ても簡単となるものである。

【0118】また、請求項5記載の発明にあつては、上記請求項4記載の発明の効果に加えて、第1と第2の防水部は歯車の軸を軸支する一方の基台と一体に形成しているので、部材点数を削減できて安価となると共に組み立ても簡単に行えるものである。

【0119】また、請求項6記載の発明にあつては、上記請求項2記載の発明の効果に加えて、基台に軸支した軸の両側に歯車を固定し、防水部材を該軸の両歯車間において封水するように配設してあるので、減速歯車の軸の両側に固定した歯車間の軸部分において防水部材により封水するという簡単な構成で、駆動源側を回転シリンダー側に対して封水することができ、また、歯車の回転によって巻き込まれてくる毛の侵入を確実に防止することができて、脱毛装置をより清潔にすることができるものである。

【0120】また、請求項7記載の発明にあつては、上記請求項6記載の発明の効果に加えて、軸の両側に固定

された歯車が、大歯車と小歯車とからなるので、軸の両側に固定された大歯車と小歯車とが減速歯車を構成することになって器具の高さを低くしてコンパクト化が図れるものであり、また、簡単な構成で減速歯車を構成して大歯車と小歯車との間に防水部材を介在させて防水ができるものである。

【0121】また、請求項8記載の発明にあつては、上記請求項2記載の発明の効果に加えて、本体ケーシングに内蔵した歯車列部分において防水部材により封水し、回転シリンダーが本体ケーシングに対して着脱自在となっているので、回転シリンダーを本体ケーシングから外して回転シリンダーの下面部を含めて掃除したり、また、本体ケーシングのギア列の一部を掃除することが可能となり、また、回転シリンダーを外して回転シリンダー側のみ重点的に水洗いするということも可能となるものである。

【0122】また、請求項9記載の発明にあつては、上記請求項2記載の発明の効果に加えて、回転シリンダーに駆動伝達する最終段歯車の軸部分において防水部材により封水したので、毛や皮脂がギア列を配置した部分の内部に侵入するのを防止し、この結果、掃除に当たっては主として回転シリンダー側を掃除すればよく、また、水洗いで簡単に毛や皮脂を落とすことができるものである。

【0123】また、請求項10記載の発明にあつては、上記請求項1記載の発明の効果に加えて、駆動源を内蔵した本体ケーシングから駆動源により回転される回転軸を突出し、回転軸の回転が伝達されて回転する回転シリンダーを備えた脱毛ヘッドを本体ケーシングに対して着脱自在に取付け、防水部材が、回転軸部分において封水しているので、防水部材を駆動源側の回転軸に取付けて封水するという簡単な構成で駆動源側を回転シリンダー側に対して封水することができ、歯車列部分に防水手段を取付けて封水する場合に比べて防水部材の構造が簡略化でき、また、掃除に当たっては脱毛ヘッドを取り外して脱毛ヘッド側を主として掃除すればよく、また、水洗いに当たっても脱毛ヘッドを取り外して脱毛ヘッド側を主として水洗いすることで綺麗な掃除ができ、また本体ケーシング側を水洗いしても防水部材で防水してあるので問題がないものであり、本体ケーシング側も綺麗に掃除できるものである。

【0124】また、請求項11記載の発明にあつては、上記請求項10記載の発明の効果に加えて、歯車列を本体ケーシングから分離される脱毛ヘッドに設けたので、ギア列に巻き込む毛を簡単に洗い落とすことができるものである。

【0125】また、請求項12記載の発明にあつては、上記請求項1記載の発明に加えて、駆動源がモータであるので、本体ケーシング内に簡単に駆動源を組み込むことができるものである。

【0126】また、請求項13記載の発明にあつては、上記請求項2記載の発明の効果に加えて、駆動源であるモータ及び歯車列を内蔵した基台を本体ケーシングに内装するとともに本体ケーシングと基台の上部外周との間に第2の防水部材を介装してあるので、第2の防水部材により本体ケーシングと基台との間から毛や皮脂が侵入するのを防止できて、また、水洗いした際にも本体ケーシングと基台との間から水が内部に浸入するのを防止できるものであり、この結果、モータ及び歯車列を内蔵した基台を上部のみが本体ケーシングと第2の防水部材を介して水封できる構造とすればよくて、基台へのモータの組み込み部分は防水を考慮しなくてもよく、基台へのモータの組み込み等の構造を簡略化できるものである。

【0127】また、請求項14記載の発明にあつては、上記請求項13記載の発明の効果に加えて、基台の上部に歯車列を構成する歯車の一つが位置する開口部を設け、基台内のモータと上記開口部に位置する歯車との間の駆動伝達経路の途中に防水部材を配設するので、モータと基台の開口部との間において防水部材によりモータ側に毛や皮脂や水等が入らない構造とすることができるものである。

【0128】また、請求項15記載の発明にあつては、上記請求項14記載の発明の効果に加えて、基台にモータを内装するモータ内装部と歯車列を内装する歯車列内装部とを設け、モータ内装部と歯車列内装部とを仕切りにより仕切るので、仕切りにより簡単な構成で歯車列側からモータ側に毛や皮脂や水等が入らないようにすることができるものである。

【0129】また、請求項16記載の発明にあつては、上記請求項4又は請求項14又は請求項15記載の発明の効果に加えて、駆動源であるモータ及び歯車列を内蔵した基台が、複数の分割された基台を組み合わせたものであるから、基台にモータや歯車列や防水部材を組み込むに当たって、分割された基台であるので組み込みが簡単に行えるという利点がある。

【0130】また、請求項17記載の発明にあつては、上記請求項16記載の発明の効果に加えて、基台がモータを内装するモータ内装用基台と、モータをカバーするためのモータカバー用基台と、モータカバー用基台の外側方において歯車列をカバーするための歯車カバー基台と、モータ内装用基台とモータカバー用基台と歯車カバー基台との上部を覆う上基台とで構成され、上記複数の基台が連結固着してあるので、モータ及び歯車列の基台への組み込みが簡単にでき、また、上基台を設けることにより本体ケーシングと基台の防水を第2の防水部材により封水するに当たって上基台という一つの部材の外周部において行えばよくて、本体ケーシングとの封水の構造を簡略化できるものである。

【0131】また、請求項18記載の発明にあつては、上記請求項17記載の発明の効果に加えて、モータ内装

部と歯車列内装部とを仕切る仕切りがモータカバー用基台により構成してあるので、3部材に分割された基台の一つであるモータカバー用基台がモータ内装部と歯車列内装部とを仕切る仕切りを兼用することによって部材点数が減少して構造が簡略化するものである。

【0132】また、請求項19記載の発明にあつては、上記請求項18記載の発明の効果に加えて、仕切りであるモータカバー用基台に歯車カバー基台の両端部を当接した状態で固着してモータカバー用基台と歯車カバー基台とにより囲まれた空所を歯車列が内装される歯車列内装部としてあるので、防水部材部分で仕切る歯車列内装部の周囲がモータカバー用基台と歯車カバー基台とで囲まれて封水されることによって、封水構造を簡略化できるものである。

【0133】また、請求項20記載の発明にあつては、上記請求項19記載の発明の効果に加えて、モータカバー用基台と歯車カバー基台とにより囲まれた空所よりなる歯車列内装部の上部を開口し、この開口と上基台に設けた開口部とを連通させてあるので、歯車列内装部に内装した歯車列の一部を上基台の開口部に位置させることができ、簡単な構成で動力を回転シリンダー側に伝達する構造とすることができるものである。

【0134】また、請求項21記載の発明にあつては、上記請求項4又は請求項16記載の発明の効果に加えて、防水部材が、減速歯車部分において封水する第1の防水部と、歯車の軸を軸支する基台間の分離継ぎ目を封水する第2の防水部とを一体化したものであり、第1の防水部が歯車に設けたボス又は歯車の軸にはめ込むための環状体よりなり、第2の防水部が基台間の分離継ぎ目に沿って帯状に連続して封水するための帯状枠体よりなるので、環状体を歯車に設けたボス又は歯車の軸にはめ込むことで、歯車列の途中で封水することができ、また、帯状枠体を介して分割した基台間の分離継ぎ目部分を封水することができ、この歯車列の途中における封水と基台間の分離継ぎ目部分の封水とが一つの防水部材により連続して行えるものであり、封水構造が簡略化し且つ組み立てが容易に行えるものである。

【0135】また、請求項22記載の発明にあつては、上記請求項21記載の発明の効果に加えて、上基台から歯車列内装部内に垂下壁を突出し、歯車カバー基台から歯車列内装部内に突出壁を突出し、垂下壁の先端部と突出壁の先端部との間に防水部材を介在させ、垂下壁と突出壁とその間に介在させた防水部材とで歯車列内装部を上基台側に設けた開口部側とモータの出力軸が位置する側とに仕切り、防水部材の環状体の孔内を歯車のボス又は歯車の軸が水密的に貫通しているので、簡単な構成で歯車列内装部内を防水部材を介して歯車のボス又は歯車の軸部分で開口部側とモータ側とに封水構造により仕切ることができるものである。

【0136】また、請求項23記載の発明にあつては、



上記請求項 21 記載の発明の効果に加えて、垂下壁の下端面部を防水部材の上端面に押接し、突出壁の先端部を防水部材の側面に押接してあるので、防水部材を介して垂下壁と突出壁との間が密閉されて簡単に歯車列内装部内を防水部材を介して歯車のボス又は歯車の軸部分で開口部側とモータ側とに封水構造により仕切ることができ、封水構造が簡単となるものである。

【0137】また、請求項 24 記載の発明にあつては、上記請求項 22 記載の発明の効果に加えて、垂下壁の下端部に上半円状嵌め込み部を形成し、突出壁の先端部に下半円状嵌め込み部を形成し、防水部材に設けた環状体の上部を上半円状嵌め込み部にはめ込むと共に環状体の下部を下半円状嵌め込み部にはめ込んであるので、防水部材に設けた環状体の位置決めが確実になされるとともに環状体と垂下壁、突出壁との封水が簡単な構造ででき、また、環状体の位置決めが簡単且つ確実にできて防水部材の位置決めが確実にできて、防水部材による封水が確実にできることになる。

【0138】また、請求項 25 記載の発明にあつては、上記請求項 21 又は請求項 23 記載の発明の効果に加えて、垂下壁の下端面部を防水部材の上端面に押接し、突出壁の先端部に上方に向けて立ち上がった立ち上がり部を設け、この立ち上がり部を防水部材の下端面に押接してあるので、防水部材が垂下壁と立ち上がり部とで上下から挟持されて確実な封水ができるとともに、防水部材の取付けが確実に行えるものである。

【0139】また、請求項 26 記載の発明にあつては、上記請求項 21 乃至請求項 25 のいずれかに記載の発明の効果に加えて、横向きコ字状をしたコ字状帯部の両端部から下方に向けて縦帯状部を一体に垂下するとともに縦帯状部の下端から互いに近づく方向に下横帯状部を一体に連設して帯状枠体を構成し、帯状枠体の対向する下横帯状部の先端間に環状体を一体に連設し、垂下壁を両縦帯状部間に嵌め込んで垂下壁を両縦帯状部の内面と両下横帯状部と環状体の上面とに押接するとともに上基台の下面の開口部の周囲をコ字状帯部の上端面に押接し、突出壁の先端部を下横帯状部と環状体の下端部に押接するとともに歯車カバー基台の上端部をコ字状帯部の下面に押接し、歯車カバー基台とモータカバー用基台とで縦帯状部を挟持しているので、防水部材を上基台と歯車カバー基台とモータカバー用基台との複数に分割した基台の継ぎ目部分に沿って位置させて防水部材をが 3 つの基台により確実に支持して各基台同士の継ぎ目部分の封水を簡単な構成で行うことができるものである。

【0140】また、請求項 27 記載の発明にあつては、上記請求項 21 記載の発明の効果に加えて、モータカバー用基台から仕切り用突壁を突出し、歯車カバー基台から歯車列内装部内に突出壁を突出し、仕切り用突壁の先端部と突出壁の先端部との間に防水部材を介在させ、仕切り用突壁と突出壁とその間に介在させた防水部材とで

歯車列内装部を上基台側に設けた開口部側とモータの出力軸が位置する側とに仕切り、防水部材の環状体の孔内を歯車のボス又は歯車の軸が水密的に貫通しているので、簡単な構成で歯車列内装部内を防水部材を介して歯車のボス又は歯車の軸部分で開口部側とモータ側とに封水構造により仕切ることができるものである。

【0141】また、請求項 28 記載の発明にあつては、上記請求項 27 記載の発明の効果に加えて、仕切り用突壁の先端部を上方に向けて突出させて縦仕切り部とし、突出壁の先端部を下方に向けて垂下して縦仕切り部とし、両縦仕切り部間に防水部材の環状体を介在させているので、縦仕切り部と縦仕切り部とで上下より防水部材の環状体を挟持して簡単な構造で封水することができるものである。

【0142】また、請求項 29 記載の発明にあつては、上記請求項 3 又は請求項 21 乃至請求項 28 のいずれかに記載の発明の効果に加えて、モータ内装部内に内装したモータの出力軸を歯車列内装部内に突入させ、出力軸にピニオンを固着し、大歯車と小歯車とを有する第 1 の減速歯車の大歯車を噛み合わせ、第 1 の減速歯車の小歯車に大歯車と小歯車とを有する第 2 の減速歯車の大歯車を噛み合わせ、第 2 の減速歯車の大歯車と小歯車との間の部分のボスに防水部材の環状体を嵌め込んでいるので、複数の減速歯車のうち回転シリンダーに近い方の減速歯車部分において防水部材を取付けて封水することができ、この結果、モータに近い側の減速歯車側には毛や油脂や水が入らないようにでき、よりいっそう掃除がしやすくなるものである。

【0143】また、請求項 30 記載の発明にあつては、上記請求項 6 又は請求項 7 又は請求項 21 乃至請求項 28 のいずれかに記載の発明の効果に加えて、モータ内装部内に内装したモータの出力軸を歯車列内装部内に突入させ、出力軸にピニオンを固着し、大歯車と小歯車とを有する第 1 の減速歯車の大歯車を噛み合わせ、軸の両側に大歯車と小歯車とを固着して第 2 の減速歯車を構成し、第 1 の減速歯車の小歯車に第 2 の減速歯車の大歯車を噛み合わせ、第 2 の減速歯車の軸の大歯車と小歯車との間の部分に防水部材の環状体を嵌め込んだので、複数の減速歯車のうち回転シリンダーに近い方の減速歯車部分において防水部材を取付けて封水することができ、モータに近い側の減速歯車側に毛や油脂や水が入らないようにでき、この結果、モータに近い側の減速歯車側は掃除をする必要がないものであつて、掃除がしやすくなるものである。

【0144】また、請求項 31 記載の発明にあつては、上記請求項 29 又は請求項 30 記載の発明の効果に加えて、上基台の開口部内に第 2 の減速歯車の小歯車に噛み合う出力用歯車を配置してあるので、簡単な構成で、基台側に設けた歯車列からの出力を本体ケーシングに対して外周部を第 2 の防水部材により封水した上基台の開口

部において行うことができるものであり、また、本体ケーシング側においては開口部付近のみを掃除すればよくて掃除が容易となるものである。

【0145】また、請求項32記載の発明にあつては、上記請求項29又は請求項30記載の発明の効果に加えて、第1の減速歯車の軸及び第2の減速歯車の軸の両端部がそれぞれモータカバー用基台と歯車カバー基台とに回転自在に軸支してあるので、基台への第1の減速歯車、第2の減速歯車の組み込みが簡単に行えて、組み立て性が向上するものである。

【0146】また、請求項33記載の発明にあつては、上記請求項31記載の発明の効果に加えて、出力用歯車の軸の両端部が上基台の開口部の両内壁部に支持してあるので、出力用歯車を開口部に取付けた上基台を第2の減速歯車を組み込んだモータカバー用基台と歯車カバー基台との上部に取付けることができ、簡単に第2の減速歯車と出力用歯車とを噛み合わせて歯車列を組み立てることができるものである。

【0147】また、請求項34記載の発明にあつては、上記請求項8又は請求項31記載の発明の効果に加えて、回転シンダを設けた脱毛ヘッドを本体ケーシングに対して着脱自在に取付け、脱毛ヘッドに回転シンダを駆動するための駆動用歯車を設け、回転シンダに本体ケーシングを取付けた状態で駆動用歯車を出力用歯車に着脱自在に噛み合せてあるので、回転シンダを設けた脱毛ヘッドを本体ケーシングに着脱するに当たり、簡単な構成で回転シンダにモータの回転を伝達して回転シンダを回転することができ、しかも、掃除に当たっては、脱毛ヘッドを外すことで、隅々まで掃除ができ、また、水洗いする際にも脱毛ヘッドを外して脱毛ヘッド側のみを水洗いするということが可能となつて、掃除が容易に且つ綺麗に行えるものである。

【0148】また、請求項35記載の発明にあつては、上記請求項34記載の発明の効果に加えて、脱毛ヘッドの下面部に駆動用歯車を露出させ、この脱毛ヘッドの下面に本体ケーシングに着脱自在に取付けるためのフックを設け、該フックを駆動用歯車の露出位置よりも突出させてあるので、脱毛ヘッドを外した場合、駆動用歯車がフックよりも内側に位置することになって、駆動用歯車が他の物に当たって破損したりするのを防止することができ、モータからの回転の伝達に支障が生じないような構造とすることができるものである。

【0149】また、請求項36記載の発明にあつては、上記請求項34記載の発明の効果に加えて、本体ケーシングの上面部を構成する上基台の上面部に脱毛ヘッドの下面部のフックを着脱自在に取付けるためのフック取付け部を設け、上基台の開口部に配置した出力用歯車の露出位置よりもフック取付け部を突出させてあるので、脱毛ヘッドを外した場合、出力用歯車がフック取付け部よりも内側に位置することになって、出力用歯車が他の物

に当たって破損したりするのを防止することができて、モータからの回転の伝達に支障が生じないような構造とすることができるものである。

【0150】また、請求項37記載の発明にあつては、上記請求項36記載の発明の効果に加えて、フック取付け部にフックとの係止を解除するための操作部を設け、この操作部を本体ケーシングに設けた孔より外方に突出させてあるので、本体ケーシングの孔から外方に突出した操作部を操作することで簡単にフック取付け部とフックとの係止を解除することができて、脱毛ヘッドの本体ケーシングへの着脱が容易に行えるものである。

【0151】また、請求項38記載の発明にあつては、上記請求項37記載の発明の効果に加えて、上方が開いた本体ケーシングに基台を内装すると共に本体ケーシングと基台の上部外周との間に第2の防水部材を介装し、第2の防水部材による封水位置よりも本体ケーシングの上端開口よりはずれた位置に操作部を突出させる孔を形成してあるので、操作部を突出させる孔から本体ケーシング内に毛や皮脂や水が入っても、この毛や皮脂や水が本体ケーシングのモータを内装した部分には入らないものであつて、掃除が容易に行えるものである。

【0152】また、請求項39記載の発明にあつては、上記請求項17記載の発明の効果に加えて、モータ内装用基台の上部の一端部と上基台の一端部とが係止手段により係止され、且つモータ用内装基台の下部の他端部とモータカバー用基台の下端部と歯車カバー基台の下端部とが共通のねじ具により固着され、且つ歯車カバー基台の上部が上基台の他端部にねじ具により固着してあるので、3分割されたモータ内装用基台とモータカバー用基台と歯車カバー基台とを簡単に組立固着して本体ハウジング内に内装するための基台を構成することができるものである。

【0153】また、請求項40記載の発明にあつては、上記請求項39記載の発明の効果に加えて、係止手段による係止位置及び上下のねじ具による固着位置がいずれも第2の防水部材による封水位置よりも本体ケーシング内に位置させてあるので、本体ケーシングが縦に2つ割りされた半割ケーシングを合着させて構成してあり、両半割ケーシングの合わせ部分に第3の防水部材を介在させてあるので、分割した基台の係止や固着部分からの毛や皮脂や水の侵入を考慮する必要がなくて分割された基台の組立固着の構造が容易となるものであつて、構造が簡略化するものである。

【0154】また、請求項41記載の発明にあつては、上記請求項13記載の発明の効果に加えて、本体ケーシングが縦に2つ割りされた半割ケーシングを合着させて構成してあり、両半割ケーシングの合わせ部分に第3の防水部材を介在させるので、本体ケーシングの内部への基台等の組み込みが容易に行えるものであり、また、2つ割りされた構成であるにもかかわらず、第3の防水部

材を介在することで、半割ケーシングをのわせ部分から本体ケーシングの内部に毛や皮脂や水が侵入するのが確実に防止できるものである。

【0155】また、請求項42記載の発明にあつては、上記請求項13記載の発明の効果に加えて、本体ケーシングの内面部の上部と上基台の外周面部にそれぞれ対向して第2の防水部材嵌め込み溝を形成し、対向する第2の防水部材嵌め込み溝に第2の防水部材の外側半部と内側半部とを嵌め込んであるので、本体ケーシングの内面部と上基台の外周面部とを第2の防水部材で水封するに当たって、第2の防水部材を本体ケーシング及び上基台に対して位置決めした状態で取付けることができ、これにより、本体ケーシングに対して基台を第2の防水部材を介して位置決め支持することができるものであつて、基台に内蔵したモータの振動が第2の防水部材により減衰されて本体ケーシング側に伝わりにくい構成にでき、また防水を確実にできるものである。

【0156】また、請求項43記載の発明にあつては、上記請求項41記載の発明の効果に加えて、半割ケーシングの合わせ部分に第3の防水部材嵌め込み溝部を形成し、前後に対向する半割ケーシングの第3の防水部材溝嵌め込み溝部に第3の防水部材の前側半部と後側半部とを嵌め込んであるので、半割ケーシングの所定の位置に第3の防水部材を位置決めでき、このように位置決めされた第3の防水部材を介して半割ケーシング同士を正確な位置関係で位置合わせすることができ、防水が確実にできるものである。

【0157】また、請求項44記載の発明にあつては、上記請求項41記載の発明の効果に加えて、本体ケーシングの内面部の上部と上基台の外周面部にそれぞれ対向して第2の防水部材嵌め込み溝を形成し、対向する第2の防水部材嵌め込み溝に第2の防水部材の外側半部と内側半部とを嵌め込み、半割ケーシングの合わせ部分に第3の防水部材嵌め込み溝部を形成し、前後に対向する半割ケーシングの第3の防水部材溝嵌め込み溝部に第3の防水部材の前側半部と後側半部とを嵌め込み、第3の防水部材嵌め込み溝部の端部を第2の防水部材嵌め込み溝部に連通させ、第3の防水部材嵌め込み溝部に嵌め込んだ第3の防水部材の端部を第2の防水部材嵌め込み溝部に嵌め込んだ第2の防水部材の下面部に押接してあるので、第3の防水部材と第2の防水部材とで半割ケーシングの合わせ部分及び本体ケーシングの内周部と上基台の外周面部との間の部分を簡単な構成で連続して封水することができるものである。

【0158】また、請求項45記載の発明にあつては、上記請求項16記載の発明の効果に加えて、基台がモータを内装するモータ内装用基台と、モータをカバーするためのモータカバー用基台と、モータカバー用基台の外側方において歯車列をカバーするための歯車カバー基台とで構成され、上記複数の基台が連結固着され、モータ

内装用基台のモータカバー用基台の取付け側と反対側の上部から上方に突出した突出支持部と、歯車カバー基台の上部から上方に突出した突出支持部とで回転シンダを回転自在に支持してあるので、簡単な構成でモータ、歯車列を内装し、回転シンダを回転自在に支持する基台を構成できるものであり、また、基台を複数に分割することでモータ、歯車列、回転シンダの組み込みが容易に行えるものである。

【0159】また、請求項46記載の発明にあつては、上記請求項28又は請求項45記載の発明の効果に加えて、モータカバー用基台から上方に向けて立設した縦仕切り部と、歯車カバー基台から下方に向けて垂設した縦仕切り部と、両縦仕切り部の先端間に介在された防水部材により構成される縦仕切り部で歯車列を内装した空所を仕切り、モータ収納用基台の上部の他端部と縦仕切り部とに囲まれた部分を開口部とし、防水部材に設けた環状体の孔内を水密的に軸を貫通させ、この軸に縦仕切り部を介して両側にそれぞれ歯車を固着し、一方の歯車をモータ側に位置させてモータからの回転が伝達される入力側歯車とし、他方の歯車を開口部内に位置させて出力用歯車としてあるので、縦仕切り部で歯車列の途中を水密的に仕切ることによって縦仕切りより内側に毛や皮脂や水が入らないようにできるものであり、また、縦仕切り部を介して両側に位置する歯車のうち他方側が開口部内に位置して出力用歯車となっているので、開口部部分に位置する出力用歯車よりもモータ側の歯車列に毛や皮脂や水が入ることがなく、開口部に位置する出力用歯車のみを掃除すればよくて、掃除がより容易に行えるものである。

【0160】また、請求項47記載の発明にあつては、上記請求項9又は請求項46記載の発明の効果に加えて、出力用歯車を回転シンダに設けた歯車に噛合しているので、脱毛ヘッド側においては回転シンダに設けた歯車以外には歯車がなく、脱毛ヘッド側の掃除が簡単に行えるものである。

【0161】また、請求項48記載の発明にあつては、上記請求項5又は請求項17又は請求項45記載の発明の効果に加えて、第1と第2の防水部よりなる防水部材を歯車カバー基台に一体に形成しているので、防水部材と歯車カバー基台とを一体化することで部材点数を削減することができ、また、歯車カバー基台を組み込むことで同時に防水部材の組み込みができて組み立てが容易に行えるものである。

【0162】また、請求項49記載の発明にあつては、上記請求項10又は請求項11記載の発明の効果に加えて、駆動源であるモータを内蔵した基台を本体ケーシングに内装するとともに本体ケーシングと基台の上部外周との間に第2の防水部材を介装し、基台の上部に設けた孔にモータにより回転される回転軸を挿通して外部に突出させ、該基台の上部に設けた孔の内周面部と回転軸の

外周部との間に防水部材を介装しているので、第2の防水部材により本体ケーシングと基台の上部外周との間の防水ができ、また、防水部材により基台の孔から突出する回転軸の防水ができ、これにより基台に内蔵したモータを回転シリンダー側に対して確実に封水することができるものであり、また、第2の防水部材を設けるので、基台へのモータの内蔵に当たり、水封等を考慮する必要がなく、基台へのモータの組み込みの構造を簡略化できるものである。

【0163】また、請求項50記載の発明にあっては、上記請求項11又は請求項49記載の発明の効果に加えて、回転軸の上端部に係合部を設け、脱毛ヘッドに設けた歯車列の始端の歯車に回転軸を抜き差し自在にはめ込むための嵌め込み穴を形成すると共に嵌め込み穴に係合部に着脱自在に係合する被係合部を設けてあるので、脱毛ヘッドを簡単に着脱でき、また、脱毛ヘッドを取付けた状態では係合部が被係合部に係合できて、簡単な構成で確実に回転軸の回転を脱毛ヘッドに設けた歯車列の始端の歯車に伝達することができるものである。

【図面の簡単な説明】

【図1】本発明の脱毛装置の一実施形態の正面断面図である。

【図2】同上の平面図である。

【図3】同上のモータ部分で断面にした側面断面図である。

【図4】同上の防水部材部分で断面にした側面断面図である。

【図5】同上の本体ケーシング部分の分解斜視図である。

【図6】同上の防水部材を歯車カバー基台とモータカバー用基台と上基台との継ぎ目部分に介在して取付けた状態を示す斜視図である。

\*【図7】同上の防水部材と歯車カバー基台とを示す分解斜視図である。

【図8】同上の脱毛ヘッドの分解斜視図である。

【図9】同上の回転シリンダー部分の分解斜視図である。

【図10】同上の本体ケーシングから脱毛ヘッドを外した状態の正面断面図である。

【図11】同上の防水部材を歯車カバー基台に一体化した斜視図である。

10 【図12】本発明の他の実施形態の正面断面図である。

【図13】同上の防水部材を歯車カバー基台とを示す分解斜視図である。

【図14】本発明の更に他の実施形態を示す正面断面図である。

【図15】同上の平面図である。

【図16】本発明の更に他の実施形態を示す正面断面図である。

【図17】同上の本体ケーシングから脱毛ヘッドを外した状態の正面断面図である。

20 【図18】同上の回転軸に設けた係合部と歯車に設けた被係合部とを示す分解斜視図である。

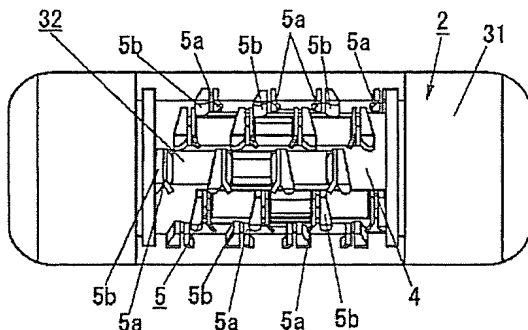
【図19】従来例の正面断面図である。

【図20】従来例の側面断面図である。

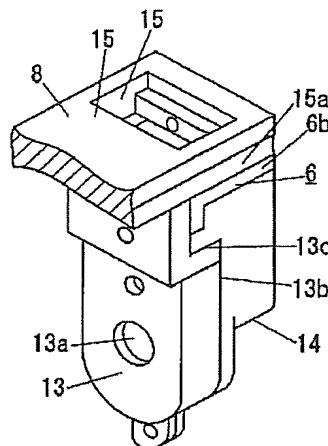
【符号の説明】

- 1 本体ケーシング
- 2 脱毛ヘッド
- 3 モータ
- 4 回転シリンダー
- 5 爪
- 6 防水部材
- 8 基台

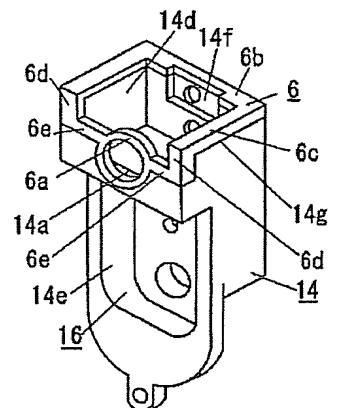
【図2】



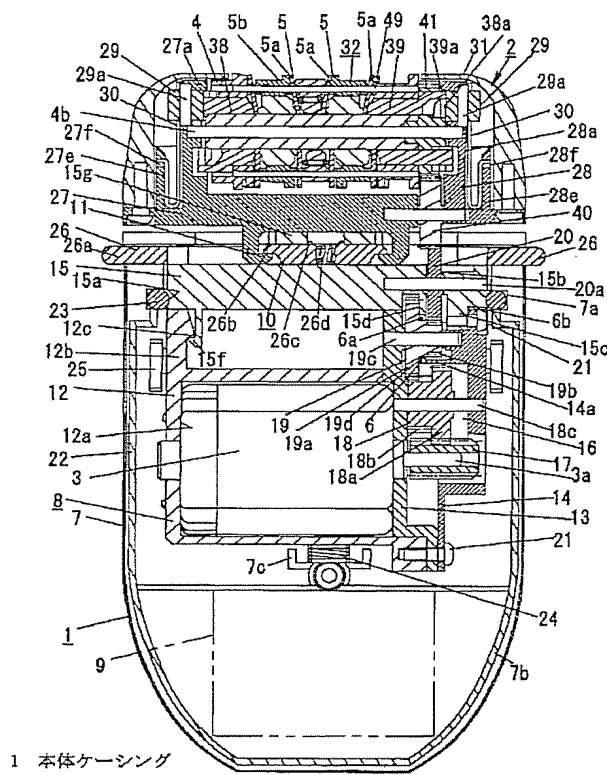
【図6】



【図11】



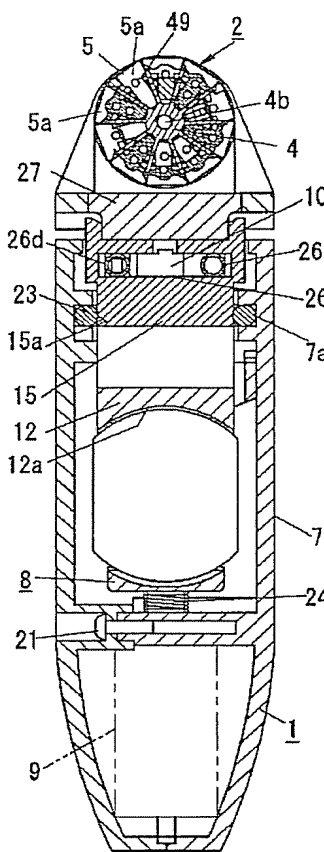
【図 1】



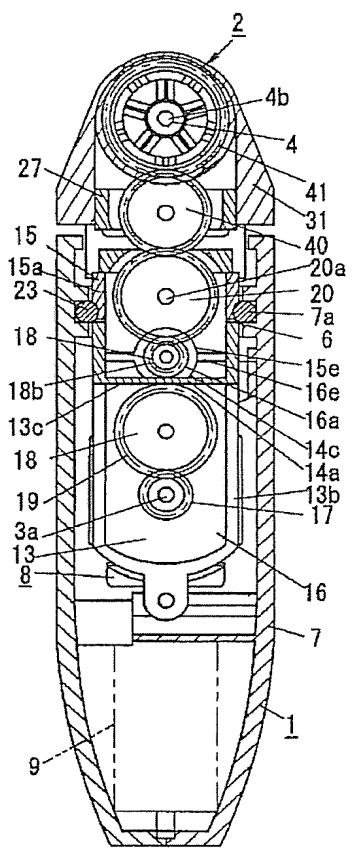
- 1 本体ケーシング  
2 脱毛ヘッド  
3 モータ  
4 回転シリンダー

- 5 爪  
6 防水部材  
8 基台

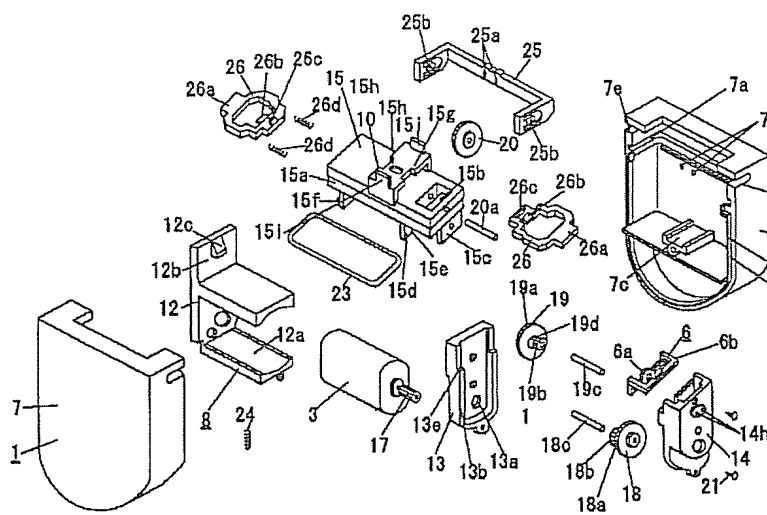
【図 3】



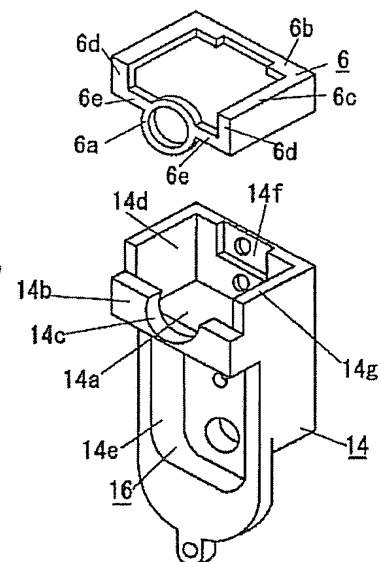
【図 4】



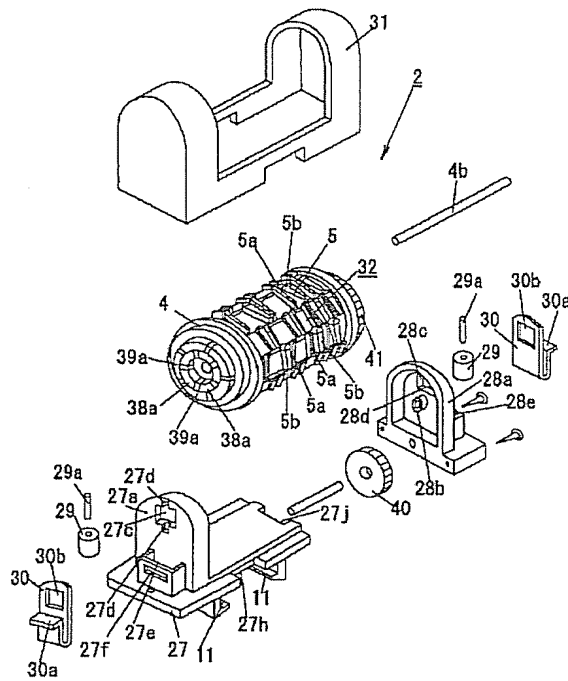
【図 5】



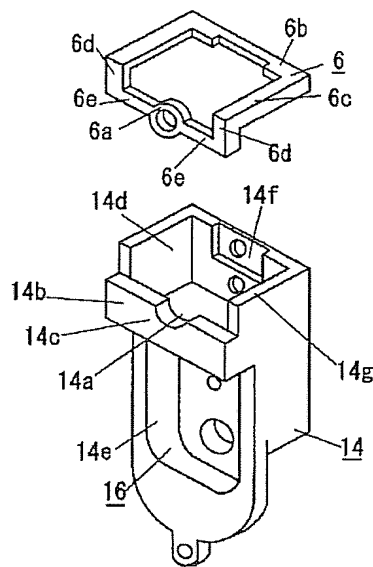
【図 7】



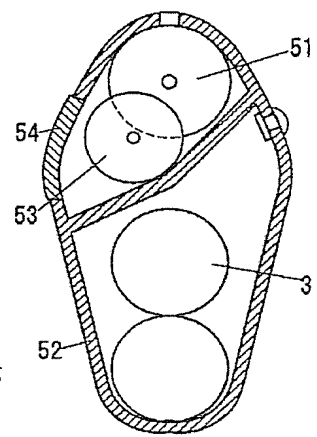
【図 8】



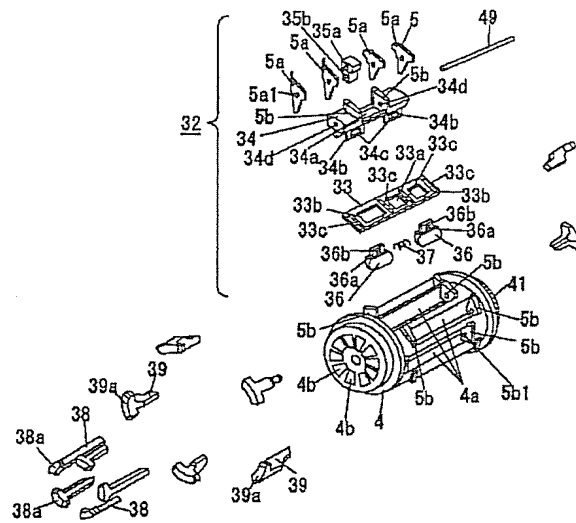
【図 13】



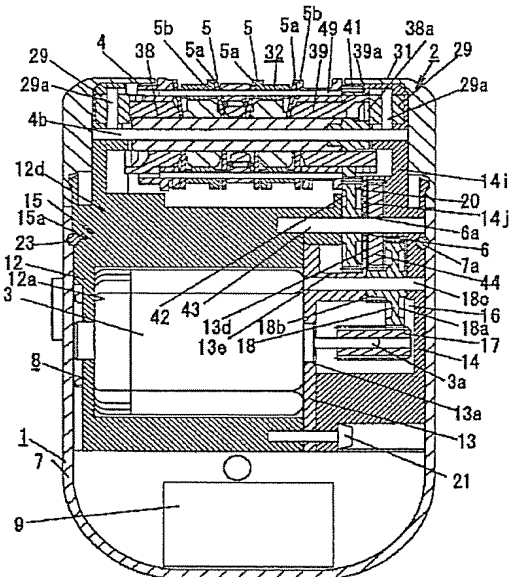
【図 20】



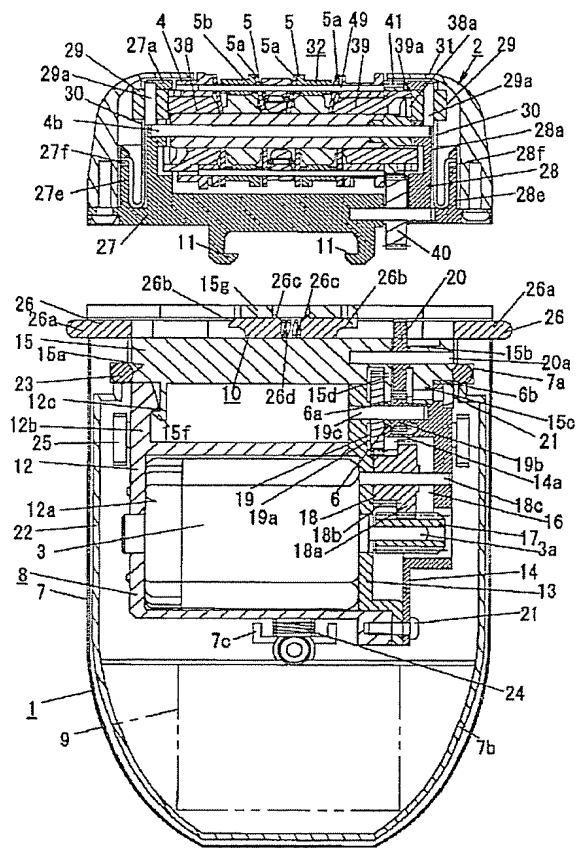
【図 9】



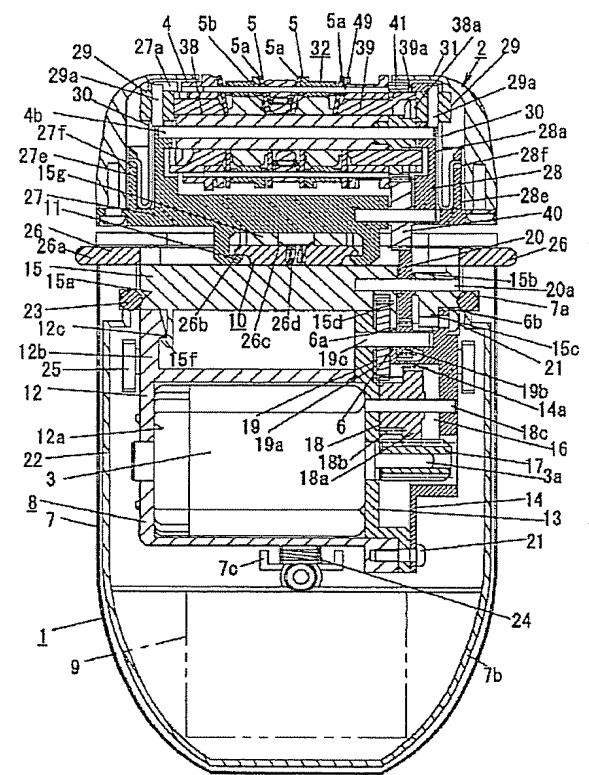
【図 14】



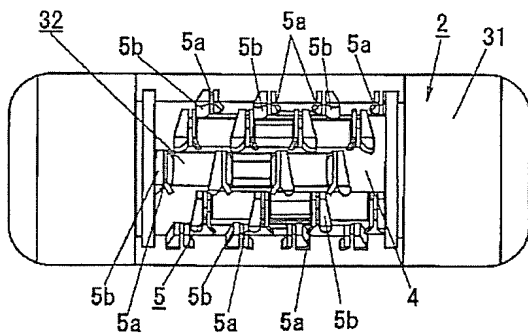
【図 10】



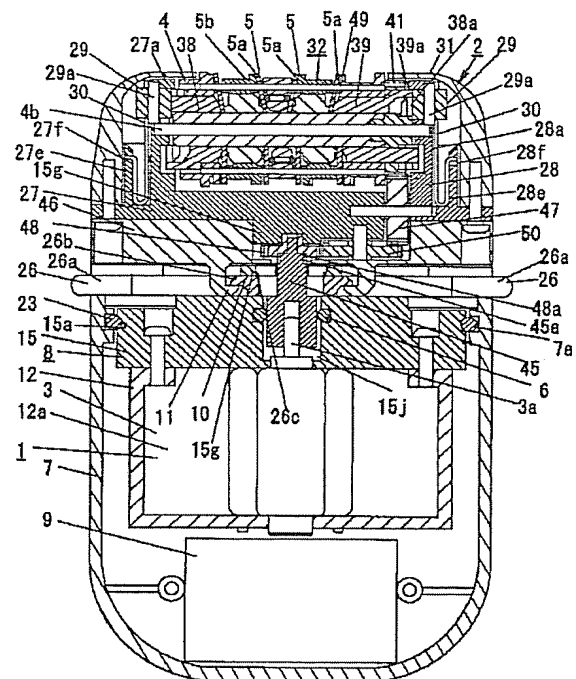
【图 12】



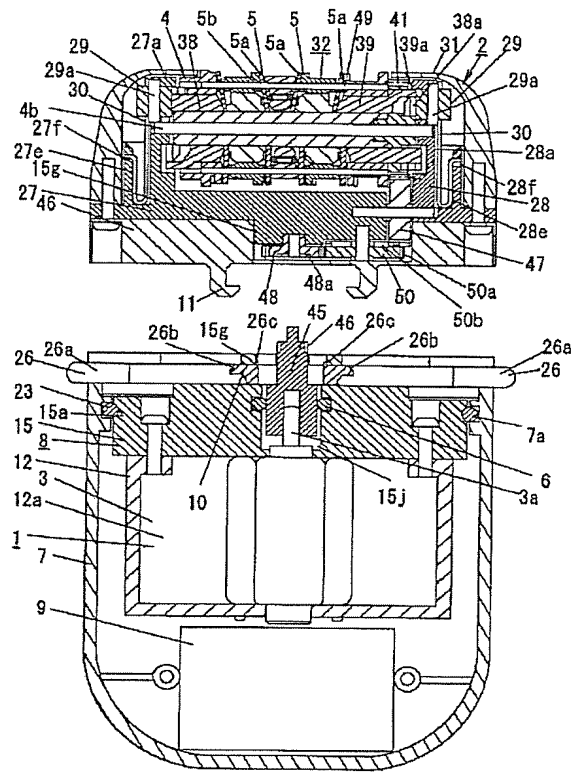
【图 15】



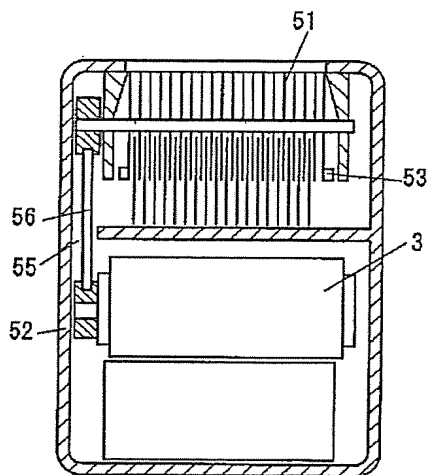
【図 16】



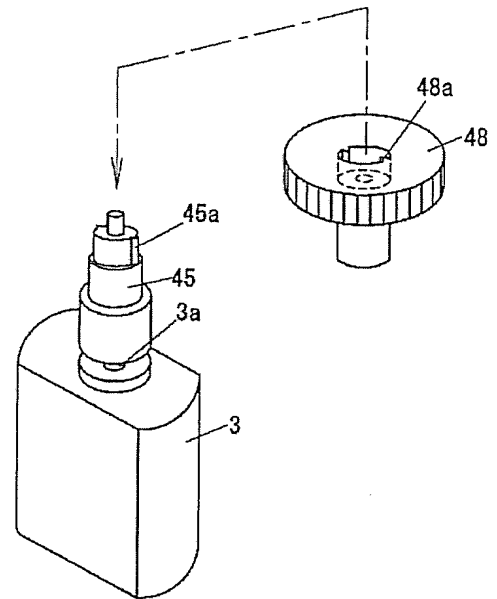
【図 17】



【図 19】



【図 18】



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